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177 There are other factors which give to
311 much of the area we are now considering
563 important uniformities in culture. The expansion of "Chinese culture" from Honan and Shantung into the whole of south and southwest China was essentially the steady outward push of an efficient agricultural technique which displaced the more primitive aboriginal food-gatherers and primitive slash-burn agriculturists, absorbed most of these people into its operation, and drove the remnants higher and higher into the hills. This process is still going on in upland areas of the South-
•24 west. The characteristically Chinese agri-
62 culture is intensive, that is, it uses large quantities of human labor in irrigating, fertilizing, and cultivating land for maximum yields. Its unit of socio-economic organization is the village, composed of those families which cultivate the surrounding fields within
62 easy walking distance. It was in the villages of rural China, spread over a vast area to exploit the land through a common technology, that the characteristic way of life developed. It is his family's village which is "home" to any Chinese, no matter what his class, how far he may wander, or how Westernized his life may have become. There are perpetuated the ties with his own family's past, symbolized by the ancestral temple and the family or clan burial ground. There are the other families

with which his own has built an enduring pattern of reciprocal favors and obligations. It is in the farming villages that the Communists are seeking to bring about fundamental changes in the way of life and to break up the old complex of family and local loyalties.

What are the patterns of village life common to the old settled Szechwan plain and the more recently colonized areas of the Southwest? We shall sketch these before discussing the variations represented by urban life.

A. The Pattern of Village Life

First of all, life in the farming village is meager. In Szechwan in 1946 the average farm was 3.9 acres, and the average square mile provided food for 650 people. In Kweichow the average farm was 3.2 acres, in Yunnan 3.1. [1] Farm families save everything; fecal matter and refuse go into a pit

1. George B. Cressey, Land of the 500 Million: A Geography of China, New York, 1955, pp. 105, 178. The richest part of Szechwan, the Chengtu plain, has a population density of 2,300 people per square mile. Ibid., p. 178. As we consider the pattern of agricultural life in the Southwest, the following data on the nature and distribution of farming throughout the area should be kept

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•24 in mind. The table is from Shina Mondai Jiten [Encyclopedia of China Problems], Tokyo, 1942, p. 435.

Province	Under cultivation (per cent)	Cultivated land in paddy fields (per cent)	Cultivated land, dry farming (per cent)
Szechwan	15	44	56
Yunnan	4	44	56
Kweichow	8	41	59

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241 near which a pig is kept, and at the time of spring fertilizing the material from the pit is mixed with topsoil or water and spread on the fields. Grass and grainstalks are carefully husbanded to be used as fodder for the farm animal, if the family is fortunate enough to have one, and as fuel for cooking, and, 291 rarely, for heating the house. Cloth is scarce, and clothing is worn until it falls apart; after that the rags are used to make the soles of 342 cloth shoes. Wood for all purposes, is more abundant in Yunnan and Szechwan than elsewhere in China, but farm buildings are made of pounded earth, mud bricks, or, in the rice region, of bamboo lathe and mud plaster. Floors are of earth, and only the dwellings of the wealthiest farmers have 735 glass windows. The dominant fact of life in the Chinese countryside is poverty. This has grown steadily worse during the last hundred years as factory-made goods destroyed village handicrafts, usury and tenancy increased, wars and ineffectual governments brought disruption and oppression, and over-population became steadily worse. "The most bankrupt countryside in Asia is the Chinese. The worst crisis of over-population China has yet had to face has been accompanied by a breakdown of traditional ideas and traditional

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527 farmers there will be little left for celebration
221 when the creditors have been dealt with.

241 In the rice lands of the Southwest the most intensive work of the agricultural year begins immediately after the New Year. At that time the farmer harvests his winter crops -- usually rape and wheat sometimes supplemented with winter beans and peas.
243 Right after the New Year, often before the winter harvest, the farmer sets out his rice plants in nursery beds near the farmhouse. Then he removes his winter crop stubble and plows and prepares the fields for the young rice plants. He spreads fertilizer over the land and then breaches the dike and allows the irrigation water to flow in. After the desired water level is reached the field is harrowed again and again; then begins the back-breaking work of transplanting the rice shoots from the nursery beds to the flooded fields. The farmer has an easier life during the ripening of the grain. As the grain ripens, the fields dry, and at last it is harvest time. The harvesting and threshing are done with primitive implements, and many hands are required; straw is carefully

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243 saved in bundles for thatch and for fuel.[3]

[427] 241 Once the harvest is in, the farmer, if he is a tenant, has to pay a share -- often 40 per cent of the crop -- to the landlord.[4] He must also deal with the tax collector who relieves him of yet another substantial share of his crop. If the year has gone well, the rice borers have not destroyed too much of his crop, and the tax collector has not been unduly rapacious, the farmer may retain enough grain to see his family through to the next harvest and have some to sell in the nearest market town. After he has prepared his fields for the crops of winter wheat and rape, the farmer and his household turn to a variety of winter chores: repairing farm implements and buildings, weaving thatch, spinning and weaving rough cloth, making shoes, and doing other household chores. With the approach of the New Year the farmer looks forward to some festivity, perhaps calling for a feast and the slaughtering of the family pig; if debt looms large, the pig may have to be sold to help pay the bills.[5]

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3. Cf. the description in Gerald Winfield, China, The Land the The People, New York, 1948, pp. 49-52. For the slightly different work cycle in the terraced upland ricefields, cf. ibid., pp. 53-58.

4. Cf. Morton Fried, The Fabric of Chinese Society, New York, 1953, pp. 186-200. On (continued next page)

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II. THE INFLUENCE OF COMMUNISM

114 668 In discussing Communist efforts to alter the Chinese way of life, it should be stressed that our material is unsatisfactory. Statistics, declarations, news releases give few realistic details of life in the villages under Communist domination, and most refugees from Communist China have come from the cities.

•241 668 First of all, the farmer's annual routine is basically unchanged. Pilot collectives are in operation, but these are few and have no immediate bearing on the farmer's work year. The most striking change in the farmer's life is the new network of associations which the government has imposed upon him and the daily barrage of advice and exhortation to which he is subjected. No longer does he cultivate his land in the manner of his ancestors with the assistance of his family, his clan, and his neighbors. He no longer sets the periods of work and of rest. The Communist leadership is determined that the peasant shall be transformed in three ways: (1) he must be made to produce more; (2) he must become a politically conscious, active supporter of the Communist regime, and (3) his attitudes and values must be radically changed.

635 August 1-8, 1955 and was attended by 650 members consisting of Chinese, Tibetans, Chuangs, Yi's and Miaos. Li Ching-ch'üan, Chairman of the Szechwan Provincial Government, made a report on the work of the past two years and the important tasks to be done in the coming winter and spring. He referred to improvements in agriculture and industry, giving the following figures for 1952 as 100:

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Industries	1953	199.11
	1954	307.9 estimated
Agriculture	1953	86 %
	1954	6 %

There were 34 national and local factories and mines in the region, 604 agricultural co-operatives and 990,000 mutual-aid teams. In the same report he claimed that the people of Szechwan supported the building of the railroads from Chungking to Chengtu and from Chengtu to Pao-chi, and also the surveying of oil fields in Szechwan.

635 With regard to the tasks of the coming winter and spring, he asked the people of Szechwan to try to reach the goal for the second year of the five-year plan. Li's report was passed. Another report on the Constitutional draft was made by Governor Li. After a serious debate, it was given a unanimous support. Finally, 87 delegates to the National Congress were elected with Chu Teh at the head of the list.[8]

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8. Kuang-ming Jih-pao [Enlightenment Daily], Peking, August 10, 1952.

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Annex "A," Subparagraph 3a,
Economic Background

AGRICULTURE

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I. INTRODUCTION

The Southwest China region is formed of four provinces - Szechwan, called "the heavenly kingdom"; Sikang, an area of awesome mountains and dense forests; Yunnan, home of many different brother nationalities; and Kweichow, the settlement of the Miaos. The topography varies considerably, the climate is as variable, and crops are raised in abundance. The Red Basin in Szechwan, watered by the Yangtze and its tributaries, is especially fertile, and the Chengtu plain is one of the most famous rice producing areas in China. In addition to being the richest province for grain production in Southwest China, Szechwan also produces large quantities of cotton, tung oil, sugar cane, silk, rapeseed, and fruit.

II. CULTIVATED LAND AND RURAL POPULATION

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The total population of Southwest China is a little over 98 million,[1] according to a

1. Jen-min Jih-pao [People's Daily], Peking, Nov. 1, 1954, p. 1.

1:Stanford U. S-4, 5 1956 AF16 SW China
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245 and her satellites. According to one estimate,
[439] the annual export of fruit from Szechwan brings to China in return 4,000 tons of steel products.[22]

●241 Szechwan Province also produces raw
433 silk, ramie, herb medicines, hogs, and over
245 400 different "native products," of which at least 40 are for export.[23] The leading export is tung oil, of which Szechwan produces an amount second only to that produced in Hunan Province in the Central-South Region. The prewar average production of tung oil was estimated to have been 1,000,000 shih-piculs (55,000 tons), and in 1947 this amount had been increased to 1,292,372 shih-piculs (71,080 tons).[24]

245 The principal special products of Yunnan
433 Province are tea, herb medicines, and oil-bearing crops such as rapeseeds and peanuts. "P'u-erh" tea and the ball of compressed green tea leaves known as "T'o-ch'a", produced in Yunnan, are popular throughout China.[25]

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22. Ibid.
23. Ibid.
24. Ma Chi, Chung-kuo Ti Shen-lin [China's Forestry], Shanghai, Commercial Press, 1952, p. 45.
25. China Daily News, New York, Aug. 15, 1955.

245 The Communists have ordered the increased
433 production of tea. The production target set for Yunnan in 1955 was approximately 48 per cent higher than the output in 1954, which in turn was 21 per cent above the amount produced in the preceding year.[26]

According to a radio report from Peking, the province of Yunnan has been designated as one of the major coffee growing districts in Communist China. The region abounds with wild coffee plants; the Communists propose that in the spring of 1956 millions of coffee plant seedlings be transplanted and cultivated.[27] The first harvest is expected in three years' time, and plants for processing coffee beans are to be built.[28]

241 Kweichow Province has comparatively
433 poor agricultural resources. With the exception of grain, this area does not produce a significant quantity of any important commodity. The output of tung oil and tobacco amounts to about 450,000 shih-piculs (24,750 tons) per
273 year.[29] "Mao-t'ai" wine, which resembles dry
433 gin, has reportedly gained an international reputation and has become one of the leading exports from the province of Kweichow.

26. New China News Agency, Kunming, April 6, 1955.

27. Examiner, San Francisco, Nov. 6, 1955, p. 9.

28. Ibid.

29. China Daily News, New York, August 16, 1955.

1:Stanford U. S-4, 5 1956 AF16 SW China
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000 exports from the province of Kweichow.[30]

241 313 433 Sikang Province, with a population a little over three million, is a comparatively undeveloped area. Its principal products, in addition to grain, are herb medicines and lumber. Sikang is considered one of the chief lumber centers in China. In the regions of the Ch'ing-i River, the Ta-tu River, the Ya-lung River, and the Sikang-Tibet plateau there are forests over 500 years old.[31] Lumber production[32] in Sikang in 1954 was reported to be 34 times that of 1950. However, since transportation facilities have not yet been fully developed, and lumber resources of Sikang Province cannot be fully utilized.

VI. WATER CONSERVATION AND IRRIGATION

312 The most renowned irrigation system in Southwest China is the Tu-chiang Yen (Tu-chiang Irrigation Works) in Szechwan Province. It was built in 250 B.C. by order of Li Ping, governor of Shu (Szechwan) during the Ch'in Dynasty. Li was an able administrator and

30. Ibid.
31. People's Daily, Peking, Oct. 21, 1954.
32. Ibid.

1:Stanford U. S-4, 5 1956 AF16 SW China
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312 steadily increased throughout the provinces of the Southwest Region.

VII. CONCLUSION

• 241 433 The Communist regime has given special attention to the intensive development of the agricultural resources of the Southwest Region. In Southwest China, the province of Szechwan plays the most important role in the production of grains and commercial crops. Since 1953, even the provinces of Yunnan and Kweichow, where the supply of foodstuffs has been generally inadequate, are asserted to have become more or less self-sufficient. Surplus grain from Szechwan is available in cases of emergency elsewhere in China, and the province is relied upon to make up the grain deficits of other regions. Southwest China also produces in abundance a number of commodities suitable for export, including tung oil, tea, silk, canned meats, wine, and fruit.

474 The movement to extend the authority of agricultural producers' co-operatives throughout the rural districts of Mainland China has accelerated since the promulgation of the "Resolution on Co-operativization" in November 1955. Since the principle of "mutual-aid" is counter to traditional Chinese practice, it will doubtlessly meet strong resistance among the peasants as soon as the cadres relax their

2: Rock K-5 (1934-) 1947 AF16 Southwest China AF16

137 133 487 occupied by schools and the militia. I found the houses here with gates walled-up for fear of bandits, which fortunately are now no more. It is related that the capital of Yün-nan was once at this place, but owing to the lack of water it was transferred to the present site near the K'un-yang Lake (Tien Ch'ih 滇池). [508] [374] [316] An aviation ground has been laid out east of Yün-nan-i. Neither wood nor charcoal are obtainable here, only anthracite which is burnt in open braziers, the poisonous gases penetrating the street from the houses. The anthracite is mined near the village of Ma-kai 馬街, 15 li south of Yün-nan-i.

Eleventh stage. — From Yün-nan-i to Hung-ngai 紅崖 is a distance of 85 li. Elevation 6,120 feet.

From Yün-nan-i the trail leads along the plain, past a quaint pond near a temple with the houses of the long village of Kao-kuan-p'o 高關坡, opposite, then along the foot-hills for 15 li, which bring us to another small plain which the trail crosses. From about the center of this plain, called Hsiang-yün-pa 祥雲壩 (Auspicious cloud plain; in Yün-nan a *pa-tzu* 壩子 is a plain), another [241] trail leads south-west to Meng-hua 蒙化, two stages (120 li) distant. Wheat and broad beans were cultivated on this plain. To the right, or north, is a lake of considerable size called Ch'ing-hai-yün 青海雲.[18] A rocky spur closes the plain, where is situated the small hamlet of Shai-chin-p'o 晒金坡.

The track now leads across the rocky spur to the shores of the lake. We find ourselves on another plain which we cross, thence over some foot-hills into a larger plain to the north. Passing through the forlorn hamlet of Kou-ts'un-p'u [137] 溝村舖, elevation 6,900 feet, with its hedges of *Opuntia monacantha* cactus, we come out into grassy country, the hills being absolutely bare and lonely in the extreme — reminding one of the grasslands of north-east Tibet. To the north there is, however, a cultivated plain, while to the south are the denuded hills. Ahead red cliffs are visible, at the foot of which is a fairly imposing Buddhist temple, and next to it the hamlet of Ch'ing-hua-tung 青華硐 (Azure flowery cave), named after a large limestone cave a short way from the temple.[19] The distance from Yün-nan-i is 40 li and it is a regular lunch-stop, although a poorer place it is difficult to imagine; it consists of about four dilapidated houses or, rather, ruins. The cave, about 120 feet wide, extends some distance into the mountain, the ceiling is very high and there are several side branches. [764] I followed the main cave for some distance but as the air became foul, and we stumbled on old coffins and human skeletons, we returned, glad to see daylight again. Two li north of Ch'ing-hua-tung is the magistracy of Yün-nan hsien, also called Hsiang-yün hsien 祥雲縣.

From Ch'ing-hua-tung the trail leads directly up the mountain and thence into a ravine surrounded by bare hills, wheat being planted in its narrow floor. Within the ravine, some distance up, the trail leads through the village of I-chiang-p'u 倚江舖, elevation 7,100 feet; the whole village is occupied with

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(Ancient Yün-nan prefectural city). Nine li south of Yün-nan hsien is the village of Li-ssu-ying 力士營. Tradition relates that it was the camp (*ying*) of the army of Chu-ko Wu-hou 諸葛武侯 (Marquis Chu-ko Liang) (181–234).

[18] Also called Yeh-ching Hu 葉鏡湖. In the center of the lake is a rock resembling a mirror (*ching*), — hence the name.

[19] Ch'ing-hua Shan is the name of the mountain in which the cave is situated.

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[P. 108 F.]

PLATE 54. — THE YÜ-LUNG SHAN OR JADE-DRAGON MOUNTAIN

玉龍山上關玉龍山

As seen from Shih-tzu Shan west of Li-chiang, looking north. Shan tao-tzu the highest peak is visible. The fields and villages in the foreground are in Ta-yen li and the center of the plain is in Pai-sha li. Hsiang Shan (Elephant Mountain) in center, right; part of Shih-tzu Shan lower right.

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*133 *137 flows along its eastern margin — *ä'a* being a ravine. The Chinese name of the hamlet is Wen-hua-ts'un 文華村. Formerly it was known as San-chia-ts'un 三家村, as originally only three families lived there. To-day there are eighteen.

The most northerly village on this part of the plain, situated at the actual foot of the snow range at an elevation of 9,400 feet, is Nv-lv-k'ö, consisting of about 100 families (PLATES 74, 75, 76).

South of Wûa-dtv k'o-dü, on the main road to Li-chiang and east of Pai-sha, is the hamlet T'a-bbu-d'a, called in Chinese T'ai-p'ing-ts'un 太平村. T'a-bbu-d'a was originally one of the 12 *d'a* (residences) owned by the Mu family. It was the place where they worshipped their ancestors; when performed in the sixth moon, the service was known as *T'a-bpö*. To the east of T'a-bbu-d'a is a small hamlet of seven or eight families called Nda-la-k'o-dyü, also belonging to Mu-tu-ts'un.

Another larger village consisting of over 100 families, called Nyi-mä-t'u-ts'an in Na-khi, and in Chinese, Hsiang-yang-ts'un 向陽村 (Facing the sun village), is north-east of Pai-sha.

241 [134] Rice cannot be cultivated on this northern part of the Li-chiang plain, as the soil is too stony and there is not enough water to irrigate the fields, furthermore the altitude is too great. The Na-khi plant wheat, maize, potatoes, barley, oats, beans and peas also the rape-turnip *Brassica rapa depressa* which they call *ngyu* (the *man-ching* 蔓菁 of the Chinese). The tuber itself is called [249] *'a-k'ö*. Opium was also grown for Chinese consumption. South of and in the actual neighborhood of Li-chiang, opium was grown in the spring, and rice during the rainy season.

Gv-bö, in Chinese, Chiu-tzu-hai 九子海 (Nine lakes) is a district lying east of the long limestone spur which hems in this part of the plain. It has been settled only recently. Peasants from the village of Pai-sha-kai have started homesteads and planted fields. Previous to the settling of the Na-khi, a few Li-su and Lo-lo had built their poor huts there and carried on cultivation. The Chinese name is derived from the several circular basins which are filled with water all the year round.

*133 *137 The range in which is situated Gv-bö, better known as Gv-bö la-zhêr gko [the name appears also in Na-khi literature, and has reference to the tigers which once roamed in its forests and meadows: *la* = tiger, *zhêr* = sound, noise, *gko* = alpine meadow], is composed of old limestone. The sharp rocks projecting through the mass of scrub oak (*Quercus semicarpifolia*), give it a peculiar aspect. The highest point of this range is the triangular peak Lv-zhêr-dsu (H-M., Lajatso), approximately 12,000 feet in height. The best approach is from the village of Nv-lv-k'ö or Ssaw-ssu-k'a, whence the ascent can be accomplished in about three hours. From its summit one obtains a glorious view of the entire Yü-lung Shan, that is, the part south of the Yangtze gorge. The northern end of the Li-chiang plain is covered with low pines and oaks (PLATES 77, 78), especially scrub oak; many herbaceous plants with beautiful flowers form lovely carpets in the summer months, and enliven the otherwise grey, stony waste.

Immediately east of the village of Nv-lv-k'ö is a low, circular mound, looking for all the world like an extinct volcanic cone. It is known to the Na-khi as La-lo-dtö-gkv, including a small ravine to the north of it. On the top of this

2: Rock K-5 (1934-) 1947 AF16 Southwest China AF16

rising to over 20,000 feet into an azure sky, while Ha-ba ndahĕr nv-lv rears its snowy head high over the crags and pinnacles forming the last of the spur to the west, at the foot of which the Yangtze roars some 10,000 feet or more below, ever carving a deeper and deeper gorge. Range upon range is visible, as well as the Yangtze in its trench at Ta-ku after it emerges from the gorge between Ha-ba ndahĕr nv-lv and the crags of 'A-ts'aŋ-gko.

From 15,500 feet on, the grade is gentle and the going is good. We continue on the top of the wide spur leading to the broad peak, over thousands of tiny, loose, sharp limestone rocks. The entire surface of the hard limestone has been split into myriads of fragments by the action of the ice. The wall of rock which forms the eastern part of the gorge is cleaved several feet deep into a forest of columns as if the entire surface had been chopped up with a giant's axe. From the summit down to 17,000 feet the broad spur is buried beneath a massive glacier, the ice lying in folds like the train of a wedding garment (PLATE 87). The rocks here change in shape, resembling angular sticks several feet in length, and only about two inches in width. They lie about parallel to each other, having been split by the action of severe frosts and ice. Quartz is not uncommon here, also iron-bearing rock and pure white marble. The ascent to the summit of this mountain can easily be accomplished, one needs only follow the western outer edge or rampart which hems in the glacier, and which is usually free of snow. The only obstacles are the terrific gales which blow over these mountains, whirling the snow in huge columns like smoke into the air. If one wishes to ascend Gyi-nä nv-lv, camp should be pitched in the gorge west of it, on a broad shelf or terrace, suitable for a camp, a little below 16,000 feet. At 14,500 feet and even higher we found *Lerwa Lerwa major* on the rocky, barren waste and also several snow chickens, *Tetraogallus tibetanus henrici*, neither hitherto recorded from Yün-nan.

6. THE REGION BETWEEN TA-KU (NDA-GV) AND GKO-NDIA-GKV

Ta-ku and the many small villages belonging to it are collectively called Ta-chü li 大居里. Ta-ku itself is situated on a fan-shaped plain mainly composed of conglomerate. To the west the plain is bordered by the Gyi-nä nv-lv and the Chien-t'ai Ho 箭台河. The Yangtze emerges here from the terrific gorge which it has cut for itself through the Li-chiang snow range, and flows east for a short distance through the conglomerate plain and then north at the foot of a mighty range — the Dzu-k'u nv-lv as it is called by the Na-khi of Ha-ba and Bbĕr-ddĕr. The plain through which the Yangtze flows, 600 feet below the main village of Ta-ku, drops in terraces towards the river. It is entirely inhabited by Na-khi, except for a few Chinese settlers. The climate is warm enough for two crops to mature in one year. Wheat, panicled millet (*zhu* 蜀), cotton, rice and maize are grown. Out of the millet stalks they make sugar known as Sha-t'ang 沙糖. *Cannabis sativa*, the *ma* 麻 (hemp plant) which the Na-khi call *ssaw*, is much cultivated, especially the female plant which gives better fibre and which they call *ssaw-mä*.

Ta-ku is 140 li north of Li-chiang. To the west of the village is a large spring called Lung-ch'üan 龍泉 (Dragon spring); in the days of a native official, its water was conveyed in irrigation ditches to the higher fields. Near the

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The finest stand of pine forest in this part of Yün-nan was once here. Trees a hundred feet tall, with perfectly straight boles stood here until the Lo-los came from Ta-liang Shan 大涼山 to settle. Clan feuds had forced them to wander and they came to this wild region. They cleared most of the forests and, cutting down the magnificent hard yellow pines set fire to them as they lay on the ground. Of the smaller twigs and branches they would make oblong piles, cover them with sod, and then burn them; the ashes they ploughed under. This method of agriculture is mentioned in Chinese records about Lo-lo, as ploughing (cultivating) with fire. They made a desert of the land and the smoke clouds of the burning forests enshrouded the landscape (PLATE 93).

Water is scarce, there being only one small water-hole which is dry in winter, while in a small ravine near by a little brook furnished the only regular water supply for the entire community. From here the women carried the water in wooden buckets to their homes. As they depended entirely on rain for irrigation, they grew mainly potatoes, oats and buckwheat. The potatoes they ate baked in live coals. For over ten years they lived here, cultivating the dry lands, until, on account of almost daily robberies they were forced in 1931 to leave Ghügh-t'o. As the area is easily controlled on account of its being surrounded by the Yangtze on all sides, they could never return. Some went to Bbêr-ddêr, some to Yung-ning, the Li-chiang soldiers standing by on the banks of the Yangtze until the last Lo-lo had left with wife, child, sheep and pig. Thus they went east and north of the river with their few belongings to find new places to devastate (PLATES 94, 95). In their abandoned fields, young pines have sprouted again.

From Ghügh-t'o, the trail descends into a dry valley and pine forest. Ghügh-t'o like Lo-shui-tung 落水洞, possesses funnel-shaped sink-holes, the narrow part being lined with limestone; they are, however, not so numerous. Ere reaching the hamlet of Mba-yi-wla one passes a large, forested, limestone mountain called T'khi-t'khi 'a-lv-k'o (To shake off fear at the foot of the cliff) to the east of the trail. It is said that formerly tigers inhabited this region (leopards are still to be found) and people were afraid when they reached that spot.

Diagonally across the hill is a much lower mound, its slopes covered with pines; on its top a mud fort was erected, that is, a simple encircling low, mud wall. This fortification, called La-bpu Wua-ssä, was constructed during the Mohammedan rebellion in 1856, when the Moslems were being slaughtered by the Chinese at Ta-li and elsewhere. As the Chinese officials had fled from Li-chiang, a La-bpu (La-pao) Na-khi headman, by name Wua-ssä, had made himself magistrate and Fu-kuan; he liberated all the prisoners in the jails and slaughtered many Moslems. He forced Li-chiang merchants and well-to-do people, who had lent money to La-bpu peasants at exorbitant rates of interest, to take the place of cattle before a plough, and carry heavy loads. When they were unable to perform such work he addressed them thus: "As you are unable to do the work of a cow ploughing the fields, or to carry a load, you had better drink new milk," and thereupon had them beheaded. By the drinking of new milk he intimated that they had better be killed, to be reborn as babies. Many who had left their old masters, whom they maligned in order to in-

2; Rock K-5 (1934-) 1947 AF16 Southwest China AF/6

gratiate themselves with him, and hoped to be enrolled as his followers, were also told that it were better they too "go and drink new milk." For if they were now speaking evil of those whose food they had eaten, would they not probably speak evil also of him after having eaten his? And so saying, he had them beheaded. Nothing is known of the end of Wua-ssä's career.

The Na-khi village of Mba-yi-wùa (H-M., Bayiua; Chinese, Ming-yin-wu 明 印 坞), not far distant from Wua-ssä's fort, is situated on the slopes of a hill at an elevation of 10,160 feet, with cultivated fields surrounding it. Wheat, oats, hemp, rape turnips (*Brassica rapa depressa*), buckwheat and maize are grown by the inhabitants. The village is not a large one and the Na-khi are still more or less uncontaminated. Their women still wear the genuine Na-khi dress, a short, much pleated skirt of greyish-white homespun hemp cloth, with blue borders and horizontal stripes. Heavy silver ear-rings, the size of a large key-ring, with heavy pendants, are inserted into the lobes of the ear, the rings extending below the shoulders (PLATES 96, 97).

The village boasts of a temple situated on the top of the hill over looking it. By far the finest view of the entire snow range is to be had from the temple terrace (PLATE 98). A sunset I once witnessed over twenty years ago from this spot will remain to me unforgettable: As the sun disappeared behind the snowy range, there shone forth magnificent rays above the battlement-like crest, each sharp crag causing the deflection of a ray, while the peaks themselves were enshrouded in cold mist. In the brilliant light of the full moon, shining in a crystal-clear atmosphere, the long snow range resembled a sleeping dragon fashioned of ice.

To the east of Mba-yi-wùa a deep gorge extends towards the Yangtze, called Gyi-t'khi lo, a branch of which is known as Dto-bpo lo; from here a trail leads into the Yangtze valley, whence several ferries ply across to Yung-ning territory.

The highway north continues over lofty mountains in the center of the loop, first turning west at the village of Mba-yi-wùa, and thence north up a narrow valley through beautiful pine forest, the trees 80 to 100 feet tall, until it comes to a peculiar meadow of great beauty. This is called Nda-za dü or Nda-zaw dü (Land of the descending hoar frost), elevation 10,600 feet. It is peculiar because the meadow is really a basin without an outlet, surrounded by limestone mountains forested with pines; its center, a bog, drains into a little brook or stream which has its source to the north of the meadow. The stream gathers together various brooks and disappears near the foot of the western mountain wall into a hole in the limestone.

From Nda-za dü we climb the eastern hill-side through dense virgin pine forest alive with song birds. To the west of the trail the ravine, which opens into Nda-za dü, narrows and is filled with magnificent spruces (*Picea likiangensis*). Continuing at an elevation of 11,000 feet, we leave the pine forest and enter mixed forest of tall spruces, hemlocks and large oaks, associated with maples, rhododendron, *Dipelta yunnanensis*, etc. This stretch of forest is known as Gka-ts'an-ssu-gka-ts'an. Beyond a few larches make their appearance, also firs, but most numerous of all and by far the stateliest tree of this region, is the Yün-nan hemlock, (*Tsuga yunnanensis*). Alas, the finest part of this forest has been burned, and only the black charred trunks remain, some

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Of the forests only a remnant remains, the Lo-lo having burned the huge oaks, in fact cleared the whole mountain-side. After ploughing the ashes under, they plant their buckwheat for one or two years, and then move on again, leaving behind them desolation, only to repeat the performance elsewhere. The slopes of the snow range are terrifically steep and once denuded of their forests, the land of the villages below in the Yangtze valley, of which only a narrow margin is arable, will be in danger of being washed away by the floods descending from the mountain. It is a pity that the government is indifferent to the preservation of the magnificent forests which still exist in this region, and allows whole areas to be laid waste by Lo-lo and Chinese alike. The Lo-lo are the greatest enemies to forests: wherever one meets that tribe one finds desolation; countless charred and fallen trees cover the landscape. When they are in need of firewood they will cut down additional trees instead of utilizing those already lying about by the thousand. This is especially true where they have settled in pine forests, as at Ghügh-t'o, north of Li-chiang (p. 231).

From this forest-remnant we emerge on to a small alpine meadow called Ngv-dzü, elevation 10,200 feet, and continue down the valley, crossing several lateral streams, the last of which is called Lä-ngu-dtô. At 8,800 feet, where the stream and valley make a sharp bend west, we enter pine forest, at the upper end of which is a clearing called T'o-k'ö-shĕr (Long foot of the pine). Here in this forested valley not a breath of wind is stirring, while the eastern slopes of the snow range and the northern plain are swept by gales in the late winter and early spring, and the snow blown off the peaks and spurs in great masses resembling clouds. From T'o-k'ö-shĕr a trail branches north and follows on the middle slopes of the range to a famous cave called T'ai-tzu tung 太子洞, which is described separately. The trail to the Yangtze descends steeply through what is left of the once magnificent pine forests.

Most of the building lumber for Li-chiang comes from these forests; a dozen boards an inch thick, 12 feet long, and 1 foot broad, sell for Yün-nan $3, or about Chinese $1.50 delivered. The boards are of various sizes and grades, the smaller ones selling for Yün-nan $2.50 a dozen. This is reckoned in pre-war silver dollars.

The trail winds through the forest, but does not descend straight to the Yangtze. It turns north to a gap known as Ma-an Shan 馬鞍山 (Horse-saddle Mountain), past a hamlet called Zi-shĕr-dto (Long grass hill) and the little village of Bbu-k'aw-dtü nestled against the valley wall below. This mountain path skirts several lateral valleys before and after reaching Ma-an Shan, where the Yangtze becomes first visible as a broad blue-green band, hemmed in to the west by a range 13,000–14,000 feet in height. Here in the river valley below are situated various hamlets, as Llü-tsu-ndu across on the west bank, and others further up-stream on the east bank, near the mouth of the valley down which the trail leads to the Yangtze. An alluvial fan extends into the Yangtze valley, and here are situated the villages of Dzä-bpö-dzü, Gkv-na-wùa and Llü-dtü-maṇ.

The trail continues through pine forest, at an elevation of between 7,800–7,400 feet, to a bluff of the latter height, from which the Yangtze valley can be viewed to advantage, up-stream as far as A-khi. Down-stream, the

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Yangtze, here called Chin-sha Chiang 金沙江 by the Chinese and Ha-yi-bi (Gold stream) by the Na-khi, makes a horse-shoe bend near the region called 'A-gko-gyi-k'o (Spring amongst the cliffs) after a spring and a tiny hamlet of the same name. On the opposite bank is the hamlet of La-shêr-lo (PLATE 113).

From the bluff the trail leads to 'A-ngaw-mbu (Rocky hill difficult to cross), referring to the boulder-strewn place. The village is at 6,350 feet elevation. Here a deep valley opens out into the Yangtze coming directly from the highest peak of the snow range, its terminal valley wall is called 'A-dto-daw (Cliff wainscoting) carrying a broad stream into the Yangtze. On the north bank of this tributary, which is spanned by a stone bridge, is situated the hamlet of Lü-ts'aŋ, the Chung-ts'un 中村 of the Chinese, both names meaning Central village. Part of the snow-capped range north of the Yangtze bend is visible from here.

Cultivation extends from here as far as P'êr-dtu-wûa (H-M., Padoa; in Chinese P'u-t'ao-wan 蒲桃灣), elevation 6,350 feet, and less than three li distant. The most-planted cereal is rice, next come wheat and maize, with red peppers, tobacco and vegetables; potatoes cannot be grown, as everything goes into the plant and hardly any tubers form. Peas and broad beans are also grown. The red peppers and tobacco are sold, the latter in leaf form as well as ground. Every village has its own walnuts, which the Na-khi call *gv-du*. Tobacco they call *yu*, but the origin of the name is not known.[5] Part of the snow-capped range north of the Yangtze bend is visible from here.

Beyond P'êr-dtu-wûa dense pine forest commences which is followed by a stony waste covered with bushes of the rosaceous shrub *Osteomeles Schwerinae*, until the hamlet of Dza-dtu is reached, elevation 6,420 feet, a distance of five li. At this village which is in the ward Bä-lä-ts'o (Chinese Pai-lang-ts'ang 白[北 pei]浪村), where Yeh-yeh, the first ancestor of the Mu family, was fished out of the Yangtze (*see* the Mu Chronicle page 73). Continuing between fields we come to the hamlet of Ndzi-mbü-lü, elevation 6,320 feet, thence to the village of Yu-lo, the Chinese Ying-p'an-ts'un 營盤村, 6,300 feet. Various villages, as Ggö-lo and Muaŋ-lo, named after two ravines (*lo*), the upper (*ggö*) and the lower (*muaŋ*), are situated on the opposite west bank. At Yu-lo the trail turns at right angles down to the Yangtze where a flat-bottomed ferry crosses it to the hamlet of Ggö-lo (PLATE 114). The elevation at the river bank is 6,070 feet. A fine view is obtained from here of Ha-ba ndshêr nv-lv (H-M., Tja-ta-schan) (PLATE 115).[6]

Along the steep slopes of the western Yangtze valley wall, covered with a xerophytic type of vegetation, the rocky trail continues at an elevation of 6,500 feet. There is no cultivation along the trail, until we reach the next village of Muaŋ-lo overlooking the entrance of the 'A-ts'aŋ-gko gorge. On the

[5] The word *yu*, second tone for tobacco may have its origin in the word *yu*, first tone, meaning a wilted fallen leaf, the Na-khi observing that the wilted leaves of the plant are used in smoking.

[6] HANDEL-MAZZETTI's Tja-ta-schan can again be traced to the unfamiliarity of the Na-khi with the Chinese language. His guide, apparently ignorant of the real name of the mountain, and being close to a rather important village called Ch'iao-t'ou 橋頭 (Bridge-head village), in which district the mountain is also situated, called it Ch'iao-t'ou shan, whence Tja-ta-schan.

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military map gives Ch'iao-t'ou 橋頭 below San-kai-tzu (Shang-ko-tzu) and opposite Lä-ndo (Leng-tu), while in reality it is beyond Dsi-gku, which itself is some distance north of San-kai-tzu.

Between Ssaw-ssaw-gku and Dsi-gku, or Dsi-gkv as the Li-chiang Na-khi pronounce it, are several villages, as Muan-ssu-dzhu (H-M., Musödso), or Mu-ssu-ch'ang 木思場 in Chinese, on the Li-chiang side of the river; and on the east bank, or Chung-tien side, the hamlets of Nda-lä (Ta-lieh 打列; H-M., Ta-lä), and north of it the village of Ss or Ss(ər)-lä (H-M., Sa-lä), and north of this, also on the Chung-tien side of the river, the village of Ch'ou-dzhu (H-M., Tschodjio).

[134] Near Dsi-gku the soil is red, and sandstone and mica abound. Opposite
[241] the large village of Ta-t'ang 大塘 on the Chung-tien side, the mountain-sides slope gently toward the Yangtze. Here along the river cultivation is carried on, while above the fields are dense pine forests, extending into a valley and up the steep mountain slopes on the Li-chiang side. The fields bear crops of millet and maize and, on the slopes above, rice. A large grove of lovely old oaks, through which the trail leads, relieves the monotony of the sandy fields. Here, near the village of Vu-dzhu (H-M., Mudschuo; the Chinese Wu-chu 烏竹), situated on the Chung-tien side, is a long island.

The scenery is weird and lonely, especially where the trail enters groves of Castanopsis, quercus (oaks) and pines; the mountain slopes are steep and huge boulders lie about everywhere. On the opposite side a narrow, dark valley debouches into the Yangtze at the hamlet of Nda-gka-dü. Five li beyond bring us to the village of Ba-lo (Chinese Pa-lo 巴羅) at the mouth of a long, broad valley, almost as broad as that of the Yangtze itself. An iron chain-bridge spans the Ba-lo gyi which issues from the broad valley. It has two branches, the northern one carrying the larger stream; in the southern branch, called Yi-gv lo, are situated about ten villages.

Ba-lo itself is called Ch'iao-t'ou 橋頭 in Chinese (Bridge-head) on account of the iron chain-bridge which spans the Ba-lo gyi. This is, however, not the iron chain-bridge (T'ieh-ch'iao 鉄橋) which figures so largely in all the battles fought between the Na-khi and Tibetans, nor where the Mongols and the Ming soldiers fought when conquering the territory for China. Ba-lo itself is one of the dreariest spots imaginable and compares unfavorably even with villages situated in the lonely Pa-pien Ho 把邊河 valley in the south of Yün-
[505] nan. Altogether three ferries ply across the Yangtze between Shih-ku and Ch'iao-t'ou: one at Shih-ku, where, since my last visit, a crude row-boat, such as is commonly used in this primitive part of the world, has taken the place of the raft; one at Müen-tsü-dtu; and one at Dsi-gkv.

The trail leads over the iron chain-bridge across the Ba-lo gyi,[24] and climbs the slippery rocks on the other side, leading along the steep, rocky bank down to the plain and the village of Muan-fu-k'o (Chu-ko-ling 諸葛嶺).

[24] Ch'iao-t'ou Ho 橋頭河. Its source is over 200 li north-west of Li-chiang, on the south-eastern slopes of the Han-sou Shan. It flows by the guard-station of Ch'iao-t'ou into the Yangtze. The bridge which spans it is called the P'ing-cheng ch'iao 平政橋; it was first built in the second year of Ch'ien-lung (1737) by magistrate Chiang Ch'iao-sun 江喬蓀. It was destroyed by fire in the first moon of the fifth year (1740) and rebuilt by magistrate Kuan Hsüeh-hsüan 管學宣 in the seventh year (1742).

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crosses it, over which the trail leads to Chü-tien. Instead of going over the bridge, we follow the south side of the stream to the hamlet of Hsin-i (Bi-me-t'ang in Na-khi). The southern side of the lower part of this valley is crystalline limestone, while the rocks near Bä-da are mica schist. The people are a mixture of Na-khi and Chinese, but not Tibetan as Kingdom Ward tells us. One li beyond Hsin-i we come to the village of Gu-du-wïn; here we meet with lamaistic structures, such as *mani* rock piles, on the smooth surfaces of which is chiseled the familiar Tibetan prayer, the magic formula of Chenrezig, *Om mani padme hum*. A few li more bring us to the hamlet of La-p'ïu-gku (H.-M., Lapikou; the Chinese, La-p'ieh-ku 拉蹩古) which boasts of a large Chinese temple dedicated to the Kuan-sheng Ti 關聖帝.

The trail continues up the cultivated valley where in the order of their importance, maize, rice, beans, and buckwheat are grown, also sorghum. Here, beyond La-p'ïu-gku, we cross the stream over a narrow board bridge and follow its northern bank. The trees along the bank are mostly willows,

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gether they flow south-east past Chü-tien hsün 巨甸汛 (Chü-tien military post) into the Yangtze. On the northern bank of the Chü-tien Ho, between the two bridges which span that tributary of the Yangtze, is situated a small hamlet called Pai-t'a 白塔 (White stupa, or White pagoda).

Two li south of Chü-tien on the slopes, above the Yangtze, there stands a pagoda known to the people as Man-tzu t'a 蠻字塔 (Pagoda with Manchu letters). The pagoda is actually below a Kuan-yin Temple (Kuan-yin Sou 觀音叟) near the village of A-wïn (A-wa-ts'un 阿瓦村), in the li of Chü-tien. It is about 15 feet or more high and is quadrangular. Tradition relates that it was built by Hu-pi-lieh (Kublai Khan) at the time of his Burmese campaign. His army travelled by this road (Chü-tien) while en route to attack Mien-tien 緬甸 (Burma). On their arrival at Chü-tien they were footsore and weary and they camped there. As they were people from the north it is believed that they knew Manchu characters (probably Mongolian script) and thus the building of this pagoda is attributed to Kubilai Khan. As the rock selected for the building of the *t'a* was of a poor quality, the characters soon became illegible. It was later repaired and reconstructed and a Huo-fu 活佛 (Living Buddha) was requested to write the text, previously chiseled into the rock, on the plastered walls of the repaired pagoda.

The text written in Tibetan is still legible. It reads as follows:

"Om Ma Ni Pad Me Hüm Hri!

May the pagoda with basis and globe grant long life, health, happiness and perfection for a period of hundred years (perpetually) to traversing military forces, travelers, etc., while crossing the river which has the appearance of milk.

Erected in the fire — female-sheep year, in the beginning of the year, in the third moon, on the 14th day, on a full moon, on a Thursday.

Chiseled into the rock by the inscription sculptor Nyi-ma, motivated by me A-sho La-tsu-yar.

May long life, health, happiness and perfection be granted."

This last sentence is repeated. The pagoda was to guarantee success to those who were to undertake the crossing of the river at this place. As it is said that the pagoda was erected by Mongols while engaged in an expedition against Burma, the date given above can only be April 26, 1307, or the eleventh year of the period Ta-te 大德 of the Mongol Emperor Ch'eng Tsung 成宗 (Timur or Olcheitu). It could not have been the year 1247, the previous fire-sheep year, for the Mongols did not make their appearance in Yün-nan until the year 1253.

Olcheitu succeeded Kublai Khan on the throne of China. The foundations of houses which once upon a time stood around the pagoda are still visible. Every year people worshipped here.

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From Ka-ka-t'ang the trail follows high above the stream, but descends now and again to its bed. It is in places washed out and narrowed by projecting boulders, so that the loads have to be lifted from the saddles, and carried across on their frames sideways. On this stretch it is best to follow the Tibetan custom of tying the loads directly to a saddle, rather than the Yünnanese custom of having a wooden saddle-frame which can be lifted off the saddle and rested on the ground.

A-nu-ndo hamlet. — After a march of 30 li we pass the small Tibetan hamlet of A-nu-ndo the Chinese A-nan-to 阿南多 (H-M., Anadon, Maj. D., A-nan-tu). On the steep hill-sides cultivation is carried on, the principal crops being maize millet, beans and tobacco, the leaves of the latter are tied to strings which are stretched under the eaves of the houses to dry. The trail follows the river in a north-westerly direction; the ravine becomes narrower and, about 15 li beyond A-nu-ndo, which is on the west bank, another stream joins the main stream we have been following. Major Davies places his A-nan-tu at the bend of the river where it flows west into the Mekong and receives the affluent just mentioned. This, however, is not so. The bend is 15 li north of A-nu-ndo.

The trail leads on down the spur separating the two streams and follows up the affluent from the east for a few hundred yards, crosses it over a bridge and follows the steep, rocky mountain slopes composed of slate, shale and sandstone. To the east, high cliffs with rugged peaks rise several thousand feet into the sky. We follow the main stream, augmented by the affluent, down a narrow gorge with steep, overhanging sandstone walls, a short distance beyond which the stream enters the Mekong.

Ho-chiang-ch'iao on the Mekong. — At the mouth of the stream is situated the hamlet of Ho-chiang-ch'iao 合江橋, and, one li beyond, the first single-rope bridge spans the Mekong. The bridge consists of one bamboo rope evenly suspended but sagging in the middle. A short distance beyond this bridge on the east bank of the Mekong is the hamlet Pei-ch'i-ts'un 北溪村 (H-M., Betjihsün) above which the river makes a curve at the foot of a high peak. The trail soon descends to near the water's edge, passes a huge rapid and climbs again to below the village of Lao-ch'ing-ku 老慶古, situated on a prominent bluff. Here maize is the principal crop. At the mouth of a narrow ravine, along the banks of a tributary of clear, bluish water debouching from the west into the Mekong, is the hamlet of Lao-ch'ang 老廠. Here two rope bridges span the Mekong. A few li beyond, after having passed through walnut and chestnut groves, we reach the most forlorn of all villages, Hsiao-wei-hsi 小維西 (Small Wei-hsi), the acme of neglect. At this village is a Catholic church in charge of a Chinese priest. Elevation of Hsiao-wei-hsi 6,400 feet, and a distance of 90 li from Ka-ka-t'ang.

Here the Mekong valley is inhabited by a tribe called the La-mao jen 倮毛人 (La-mao) besides Mo-so and Chinese. The *Yün-nan T'ung-chih* writes Tz'u-mao 倮毛, and has the following to say in ch. 202, p. 22b, "They dwell on the banks of the Lan-ts'ang Chiang; they delight to live near the

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CHAPTER IV

The South-Eastern Region of Te-ch'in (A-tun-tzu)

101 #133 The region from Te-ch'in 德欽 (A-tun-tzu) to Ch'i-tsung, Tibetan Je-drong (rJe-grong) [1] comprises the Yangtze drainage basin which lies in latitude 28° 30′ — 27° 35′. The Yangtze flows throughout in an arid, narrow gorge, flanked on the east, especially in the neighborhood of Pen-tzu-lan, by high, treeless, barren mountains which appear to be sandstone, one even reaching a height of 18,000 feet. This range is in Hsi-k'ang 西康, and more particularly in Hsiang-ch'eng 鄉城 country, inhabited by wild, lawless Tibetans known as the Hsiang-ch'eng-wa, or Chha-threng, written Phyag-hphreng,[2] the terror not only of Chinese and tribespeople, but of other Tibetan clans as well, even of the fearless Gang-kar-ling (Gangs-dkar-gling).[3]

Hsiang-ch'eng was established as a magistracy in the 34th year of Kuang-hsü (1908), and was called Ting-hsiang hsien 定鄉縣, but in name only, it is left severely alone by the Chinese, and the Tibetan outlaws do just as they please.

The territory here described includes the 20,000 feet snow range Pai-mang Shan, immediately south of Te-ch'in (A-tun-tzu), and two other high passes further south: the Kar-ri and the Ponge La. The valley between the two passes is called Yon-dze-khà, its stream debouches near Rong-sha (Lo-sha 洛沙) into the Yangtze. South of the Ponge La is a maze of mountains, forested with pines, etc., on the eastern slopes, and spruces and fir on the wetter western slopes.

The country north of Ch'i-tsung is mainly inhabited by Tibetans; those living near Ch'i-tsung are called the Mo-so Ku-tsung 麼梭古宗 and those around Pen-tzu-lan, Ch'ou Ku-tsung 丑古宗 (Plate 202). They are all agriculturists, but as there is little arable land except such as is available on the river terraces of the Yangtze and Yon-dze-khà, they just manage to exist.

[241] #133 The volume of water carried by the Yangtze is considerably larger than that of either the Salween or Mekong, and the current slower. Rapids occur below Chu-pa-lung 汁巴龍 (south of Ba-thang) where the river is reduced to a width of 100 yards. The barren valley slopes are composed of sandstone. The few hamlets in this arid gorge are situated on narrow shelves of alluvial detritus, with even occasional sand dunes. At Pen-tzu-lan the Yangtze is about 100 yards wide, and flows at an elevation of 7,100 feet. Here are rubble terraces covered with soil partly cultivated. Below Ch'i-tsung the character of the landscape changes completely. We have a broad valley floor with large fertile terraces, forested mountain slopes, and a quietly flowing river until Shih-ku is reached.

[1] *See:* p. 292.

[2] སྤྱག་ཕྲེང་ [3] དགའ་དཀར་གླིང་

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CHAPTER IV

WESTERN AND NORTH-WESTERN YUNG-NING

1. AGRICULTURE, ACCESS AND INHABITANTS

Yung-ning 永寧

The most important part of Yung-ning from an agricultural standpoint, is of course its plain (PLATE 220), which to-day supports 300 families, although 1,000 families could subsist there if rice were cultivated and all arable land were utilized. Only one half of the plain is now under cultivation, and rice is prohibited from being grown for political reasons. Maize, barley, buckwheat and round peas are the main crops. The plain has a plentiful water supply, as the Hli gyi or K'ai-chi Ho 開基河 [also called Lo-chi Ho 洛基河 pronounced Le-chi Ho in Yung-ning] winds through it, receiving several affluents in its course over the plain. The latter is at an elevation of 9,500 feet, is perfectly flat, and extends east to the foot of Lion Mountain (Seng-ge ga-mu). In the remote past the Yung-ning plain was undoubtedly a lake, similar to the Lu-ku Lake, which lies 100 feet higher. The plain is surrounded by mountains with many valleys debouching into it; the only outlet is the valley which leads into the Ch'ien-so country in Ssu-ch'uan. The eastern and north-eastern end of the plain is still marshy.

The next place of importance is the long Tsui-yi valley called Wa-erh-lo 挖耳羅 in Chinese, which extends south of Wua-ha Shan, west into the Yangtze. This is a very fertile valley and rice is planted in the middle upper half; the lower part is a dry, arid canyon with steep walls; the head of the valley is wooded.

To the west of Yung-ning is another long valley called Luĕ-dzu law-k'aw, which also extends into the Yangtze, with another valley joining it called Hĕr-dü, the Har-lĕr-dü of the Na-khi. These valleys unite a short distance before debouching west into the Yangtze, south of San-chiang-k'ou 三江口. The remaining arable land is along the Yangtze, especially at Pu-chio 卜窩 or Law-k'a-khi-llü [also called P'u-dyü]; then along the Zho Chhu on the Hsi-k'ang border in the west of Yung-ning, and at Pa-erh-ch'iao 壩耳橋, south of Yung-ning; and finally the few fields along the shore of the Lu-ku Hü or Yung-ning Lake.

The rest of the country is exceedingly mountainous. The highest peaks are on Wua-ha Shan, which is the northern part of the Yao Shan to the east of Yung-ning. These reach 15,500 feet or more in height.

Access. — The main approaches to Yung-ning from the south are from Yung-pei, north via Lang-ch'ü chou, the present Ning-lang 寧蒗; then from Li-chiang via the Yangtze at either T'o-lä-tsu or Chiang-wai 江外, up the Tsui-yi valley opposite Chiang-wai which is the shortest route. The northern route is via Feng-k'o 俸可 or Shang-feng-k'o 上俸可.

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CHAPTER V

The Yung-ning Plain

The Yung-ning plain (Hli-dü, which the natives pronounce more like Hli-di and the Na-khi of Li-chiang call Lü-dü) comprises an area of about 100 square li and is the most important part of the entire Yung-ning territory. The Hli dji (waters of Hli) traverses it in great curves and in winter-time it is the home of many thousands of ducks, cranes and herons. The cranes come from the Koko Nor, where they breed, to winter in the south.[1] A better place for duck-shooting is difficult to imagine. Less than half of the plain is cultivated and the peasants are strictly prohibited by their chiefs from growing rice. If rice were grown the plain could support three times the population it supports to-day.

1. VILLAGES ROUND THE LAMASERY

The Yung-ning Lamasery is the most important establishment and is situated on the western end of the plain, 10 li from the foot of Lion Mountain (Senge-ge ga-mu). Several villages cluster around the lamasery, of which the most important one is Boa-ts'o-gkv, (Place where the Hsi-fan [Boa] danced), pronounced by the Yung-ning people Ba-tso-gu. It is mostly inhabited by Li-chiang Na-khi and is also called Pi-chiang-ts'un 皮匠村 (Tanners' village). It is a nondescript conglomeration of miserable houses, the street an impassable quagmire covered with green scum. No improvements are permitted by the rulers of Yung-ning for fear of attracting outside settlers. In the middle of the road are the steaming-vats, where the people cure ox hides and deerskins. This village is immediately beyond the white Chhorten (nchhod-rten) (lama reliquary monument) and the little stone bridge. Here also Li-chiang Na-khi shoemakers ply their trade, making genuine Na-khi shoes, both of cow and Shan-lü 山羊 or serow hide, the latter a species of Capricornis.[2] They also make tall Tibetan boots, supply-

[1] Of the cranes which inhabit the Yung-ning plain and marshes the most common is *Grus nigricollis* (black-neck) the Gko of the Na-khi. This species breeds in the Koko Nor of north-east Tibet, and winters in Yün-nan. It was first described by the Russian traveller PRZEWALSKI from north-east Tibet, where I also collected it, and where its breeding-places were observed by me. Of the stork family, *Ciconia nigra* is often found in pairs in the flooded fields, while ducks such *Anas crecca*, *Anas platyrhyncha*, and *Anas nyroca* are found on the banks of the Hli dji as well as on the Yung-ning Lake. On the lake disport themselves the famous divers with lobate toes which the Na-khi call Dzu or Gvi-dsu. Two species are found, *Podiceps nigricollis* with black necks, and the North China species *Poliocephalus ruficollis poggei*, collected first in the province of Hu-pei. Other water-birds common in Yung-ning in the winter are *Mergus merganser orientalis* (the Nda-lä-lä of the Na-khi), *Casarca ferruginea*, the sheldrake (called Mba-shi-mba-lü-me by the Na-khi), *Nyroca fuligula*, *Nyroca nyroca* and others.

[2] The species found on the Li-chiang snow range and north to Mu-li as on Mt. Ki-bo is *Capricornis sumatraensis milne-edwardsii* David. It is known to the Na-khi as Yi; in their books the female is called Yi-mä mbu-här (Female serow with the blue mane).

Lp, 426 HJ

2: Rock K-9 (1934-) 1947 AF16 Southwest China AF16

(Courtesy Rev. Gaup. Su.)

PLATE 113. — THE YANGTZE VALLEY LOOKING SOUTHWEST FROM HEAD 第4-6

揚子江從上游、北西南望、自頭三號

The Yangtze forms here the border between Yung-ning and the Li-chiang district. The mountain visible through the clouds is Hua-ti-yi ze-lo; the terraced fields (lower left) belong to the village of Low-k'o-hki-lü (Pu-chio). Feng-k'o is west of the river about center of picture.

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2: Rock K-5 (1934-) 1947 AF16 Southwest China AF16

Lp.410-7]

(Courtesy Nat. Geogr. Soc.)

PLATE 220.—THE YUNG-NING PLAIN WITH LION MOUNTAIN

永寧壩與子山(雄獅山)背景

The Plain is called Hli-dü and is the largest level piece of land in Yung-ning. Its elevation is 9,500 feet. Lion Mountain, the landmark of Yung-ning, is 13,100 feet in height.

CHAPTER II

THE COMMUNITY

The Locality

West Town is within a day's journey on foot or horseback from Hsiakuan, the nearest point on the Burma Road. It has Er Hai (a lake) to one side and Ta'ang Shan, a mountain about 14,000 feet above sea level, to the other side. The general level of the ground in this part is about 6,700 feet above sea level. The chief occupation of the area is agriculture, rice being the staple crop. But trading in various forms is common both as a subsidiary and as the chief occupation. The trading includes both local exchanges in various markets and large-scale commercial adventures into the outer world. West Town is built on this peculiar form of commercialism.(3)

The locality is a small village or town, being under the jurisdiction of the district government of Tali. It has a population of about 1,000 households and about 8,000 people. Shops are not numerous, mostly groceries, cloth stores and a few food shops. There are a few native dispensaries and one apparently modern dispensary. The chief markets of exchange are the periodic fairs which take place both in and near the town.

The town is not walled. Some years ago four gates were erected which shut the town from the outlying villages at the ends of the two main thoroughfares of the town, which cross each other. At night the streets are patroled by a town-hired watchmen. But the population of the town is not only confined to within these gates. Near the town are at least nine more or less clearly marked out-clusters of houses, each of which has a name as a village. Within the four gates, each street, or each section of a street, is also called a village.

People and Culture

The town with its nine near-by and several more distant villages is under the authority of a Chen-Chang (head of a sub-district) appointed by and under the direction of the governor of the district (Hsien Chang) of Tali. A small police force, supported by the town, maintains law and order. Generally speaking, the town and its satellite villages is one of the Min Chia colonies in Yunnan. But all inhabitants in the town and in all the nine near-by villages except one insists on their Chinese origin, and will be seriously offended if suggestions to the contrary are made to them. This controversial point is not the concern of this paper. It suffices here to observe that all except the inhabitants in that one village who profess to be Min Chias bind their women's feet and wear Chinese dress. But all speak Min Chia as their mother-tongue. Most men and a few women, however, speak Chinese (with a strong local accent) as well. Here the social differences between men and women is carried to its extreme. Virginity of unmarried women and chastity of married women are heavily guarded and valued. Women work while men enjoy light conversation over a cup of tea or beside a tray with an opium-smoking pipe.

(3) For a general description of the Tali area (the geographical conditions of Tali and its environs) the reader may look up C.P. Fitzgerald, The Tower of Five Glories, London, 1941. As a serious scientific effort the book is a hotchpotch of hearsay and observation which disgraces rather than deserves the name of ethnology. This will be dealt with elsewhere in extenso.

000 horizon with which I took latitudes every clear night. My maximum and minimum thermometers very soon got out of order and defied all my efforts to get them right again. The survey was done on a scale of four miles to the inch, and I tried as far as possible to get in all the country that came in sight rather than to put in with minute accuracy the part near the road.

133 Soon after leaving camp we crossed the actual watershed which is presumably the boundary. They say there was formerly a boundary "gate" here called Shên-hu-kuan. From all this part of the road there are magnificent views of the surrounding country. To the south the hills near Sima are plainly visible. To the south-east in a nearer range of hills the gap is seen through which the road from Mêng-tien to San-ta passes, and beyond this gap is visible another range which is probably that which divides Möng Na from Ho-hsa. Far away to the east can be seen a high mountain chain which separates the Shweli from the Salween. To the north this range stretches away till it is hidden by the spurs of Tabu Pum; to the south it culminates in a very high and prominent conical hill called Kao-li-kung which is about 12,000 feet high. South of this the range seems to get lower very rapidly.

[162] [241] A steep descent of 1,400 feet brought us into the little Mêng-ka paddy plain which is inhabited by Chinese and Li-sos. The land is all cultivated but is not fertile, and the people do not get much more than a bare living off it. The head-man put me up in his house and I determined to halt here over the 7th, so as to write to the San-si sawbwa to tell him I was coming the next day.

A Shan silversmith from San-ta was a fellow-guest in Yang's house—rather an intelligent man who professed great contempt for the Chinese of Mêng-ka. Certainly the Shans are in many ways a much more civilised race than the Chinese.

579 On the morning of the 7th news came in that a caravan of Chinese traders on their way from Manwaing to Mogaung had been attacked by Kachins at a place called Möng-lawng[1]. Six mules with their loads had been stolen,

[1] I believe this to be the Shan form of the name marked on the Survey of India map as Ma-lau.

5: Davies G-5 (1894-1900) 1909 AF16 Southwest China AF16

825 sucks animals down as they cross. Our mules were fortunate enough to get across without encountering this monster. It is perhaps hardly worth any naturalist's while to come out to investigate this strange animal. A Chinaman likes to have a story to account for anything that takes place. In the spring and early summer there would be a good deal of melted snow in the water of the river, while the climate of the valley would be extremely hot and close. The sudden change from hot air into cold water might well produce cramp.

• [241] The next day, a good up-hill road brought us to P'u-p'iao, a little plain covered with villages and well cultivated with the winter crops—beans, wheat, and opium. On this march there is an alternative road to Yung-ch'ang, branching off from the village of Fang-ma-ch'ang; it is said to be shorter but more hilly than the main road which I took. Gill travelled by it, but Baber and most other travellers have come by the same road as myself. Baber mentions that he heard that the stream which runs through the P'u-p'iao plain falls into a lake, but the answers to all my enquiries were that it joins the Salween. On the Chinese map there is a small lake marked a few miles lower down, but it is shown as the source of a small tributary of the main stream.

Our road on the 21st rose to the top of a bare range at 7000 feet, and a little beyond this the Yung-ch'ang plain came in sight. The path descends to the plain at the village of A-shih-wo, just before reaching which a cave is passed in the hillside to the left which is said to go right through the hill and come out on the other side.

361 The plain of Yung-ch'ang Fu is about 18 miles long
312 and six miles wide, covered with villages and well cultivated; it is one of the largest and richest in the province. As in many other plains there is a summer crop of rice, and after the rice has been harvested in the autumn, the winter crops of beans, opium or wheat are put in. A good-sized stream running from north to south irrigates a great part of the plain, and water for this purpose is also collected in reservoirs where some of the side streams run down from the hills.

485 I put up at an inn in the middle of the town. The

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Photo by Captain W. A. Watts-Jones

Terraced fields in the Shun-ning Fu valley

Plate XVI

[Face p. 74]

5: Davies G-5 (1894-1900) 1909 AF16 Southwest China AF16

of A-lu-shih, which contains 150 houses—a large place for this hilly country. It is inhabited by a people with the bump of curiosity very largely developed.

The next morning we crossed the top of a range at 8,400 feet and from there dropped 3000 feet in three miles to Sung-lin-t'ang, a very small village which contains however a fairly good official rest-house. During this descent the green-coloured water of the Mekong was occasionally to be seen in the deep valley below.

On the 13th a further descent brought us to this river at an elevation of 3,400 feet above the sea. The valley is of exactly the same character as where it is crossed on the Yung-ch'ang–Ta-li road, the river running in a deep gorge, with steep, almost inaccessible, hills rising up from it. There is not an inch of level ground outside the river bed, which is from 80 to 100 yards wide, and is pretty well filled up with water. The current is strong, and rapids numerous.

We crossed by an iron-chain suspension bridge of the same type as those previously described. It is built where the river passes between two precipitous rocks, is 75 yards long, and consists of a plank roadway supported by 14 iron chains, the ends of which are embedded in brick piers. At that time the bridge was a little shaky and swayed about a good deal as one passed over it, and there was a man posted there to warn travellers that only one animal must pass over at a time. After crossing, the road turns westward and follows the river bank for some distance before ascending steeply to Hsin-ts'un, where we put up for the night.

On the 14th February we crossed another range and descended to the town of Shun-ning, always pronounced Shun-ling by the Yünnanese. There is nothing to call a plain here, but a fairly level strip of cultivated ground, half a mile in width, runs along a little stream called the Pei-ch'iao Ho, and tiers of terraced fields rise again above this on each side.

The town is built on the west side of the valley, on the lower spurs of the hills, and is about 5,400 feet above sea level. It is an irregular shaped polygonal a mile in perimeter, surrounded by a 15 feet brick wall backed up on the inside by the usual earth parapet. The space within

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000 were lodged. Two days of easy marching down the valley of the Pei-ch'iao Ho brought us to Yün Chou. Though this town is 1,600 feet below Shun-ning, the descent is so gradual as to be hardly noticed. At the end of the second march the road passes through a gap in a spur and comes suddenly on the town, within 100 yards.

361 438 It is built at the junction of the Pei-ch'iao Ho with the Nan-ch'iao Ho, a somewhat larger stream which runs up from the south and eventually flows into the Mekong. The town is surrounded by a soft brick wall, 12 feet high, not kept in very good repair. It contains about 800 houses, and is a larger and more prosperous place than Shun-ning. The population includes a good many Panthays and they form the principal commercial element. The trade is not very large and is almost entirely confined to dealings with the Shan States of Mêng-sa, Kêng-ma, and Mêng-ting, and with the Panthay settlement at Pang-long in the Northern Shan States.

294 438 One of the principal articles of local produce is a curious kind of waterproof coat called *tso-yi*, much used by the poorer classes in Yün-nan. It is made out of the outer fibrous bark of a sort of palm tree, called *tsung-pao* by the Chinese. At the first glance it might easily be taken for the skin of some long-haired animal.

635 Yün Chou, like Shun-ning, was formerly a Shan state. Its Shan name is Möng Yü, and there are still a few families of that race living in the plain. The Yün Chou ●241 plain is much cut up by uncultivated spurs which run out into it, but good crops of beans and sugar-cane are grown. The latter is a specially valuable product in Yün-nan, as it will not grow in the higher and colder plains.

231 On the march from Shun-ning, at the village of Jê-shui-t'ang, I saw a most curious freak of nature, a buffalo with five horns. Two of them were of the ordinary pattern, the other three grew out of the centre of his forehead, two going straight up in the air close together, and the third sticking straight out to the front. The three superfluous horns had been sawn off rather short, but there was no doubt about the fact that they were there.

000 We left Yün Chou again on the 18th February and ascended gradually, reaching the Mekong-Salween water-

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000 road descends slightly and turns up another valley to the mixed Chinese and La-hu village of Man-nung[1], where there is an official with the rank of *Hsün-chien* and a guard of 10 Chinese soldiers. I put up in a good-sized temple, built to commemorate the names of the principal civil and military mandarins who took part in the fighting against the La-hus. At the time of my visit the La-hus had been completely subdued and there was no large Chinese garrison in this neighbourhood.

563 Two more days of hilly marching brought us to Mêng-mêng[2] on the 20th April. Since crossing the Mekong we had been again in a country in which the La-hus form the greater part of the population. This tribe is almost entirely confined to the tract between the Salween and the Mekong. Among them there is in this neighbourhood a sprinkling of Chinese and also some Was or Las. The Chinese and La-hus often live together in the same village, and the latter seem now quite reconciled to Chinese rule. Mêng-mêng is a Shan state which was formerly subject to Kêng-ma but is now practically independent, though they still pay a nominal tribute of gold and silver flowers. The plain is some seven miles long and inhabited by Shans except for one Chinese village, the people of which are emigrants from Ching-tung T'ing who came here five generations ago. The town is the largest Shan place anywhere in this neighbourhood and contains 400 houses. It is governed by a sawbwa who was at the time of my visit [241] a boy of 17. The plain is well cultivated and the people seem fairly well off, but their prosperity depends on their rice fields; there is little or no trade in the state.

We left the next day, some of the Shan officials very civilly riding out with me two or three miles of the way, and then leaving me an escort of 10 men to go on with us to Kêng-ma. We camped for the night at Ya-sai, a village [197] of 40 houses inhabited by Chinese and P'u-mans. These P'u-mans speak exactly the same language as the Las of this district, but they do not consider themselves as at all the same race as the Las, though they cannot offer any explanation as to how they have come to use the same language.

[1] Man-nawng is its proper Shan name.
[2] Möng Möng in Shan.

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of the Shweli, and is some 12 miles long by eight miles broad. It is full of villages and well cultivated, and is one of the largest, and quite the richest, of the plains inhabited by Chinese Shans. The town, like all the other villages of the plain, is so surrounded with bamboos and with banyan and other trees that it cannot be seen till one is close up to it. It contains 500 or 600 houses, well built of soft bricks in the Chinese style, and most of them have tiled roofs. The sawbwa's new palace is a very fine building, occupying a considerable part of the middle of the town. There is also a large monastery, and the whole place wears a greater air of prosperity than any Shan town I have ever seen. There has been a mud wall round it, but this is now all broken down. One of the sights of the place was a panther, which the sawbwa kept shut up in a cage just outside his palace. It was said to have been caught on the hills which overlook the plain. I have occasionally seen panther's tracks in Yün-nan, and no doubt they exist in many places in the province.

I was put up in the old palace, which was occupied by the sawbwa's uncle, who then had more to do with the management of the state than the sawbwa himself. He was a very pleasant-mannered and intelligent man, apparently about 50 years of age. He had travelled all over the Chinese Shan States, and had visited Ta-li Fu and Yün-nan Fu. I sent my card to the sawbwa, and he returned the call in person. He was considered too young to govern the state, and his uncle was at that time officially recognised as regent by the Chinese authorities[1]. The sawbwa had just been to Rangoon to worship at the big pagoda, and seemed much pleased with his visit.

The height of Möng Hkwan is about 3,350 feet, and it is considered too unhealthy for Chinamen to live in except in the cold weather. A good many Chinese traders come here in the winter, but they all go away in March or April. The guide who brought us down from Hsiang-ta went back home at once; nothing would induce him to sleep the night in the plain. However we were for several days in these comparatively low-lying Shan States, but none of my China-

[1] The young sawbwa assumed the government of the state himself soon after my visit.

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generals and admirals looking about for an excuse for their defeat, described our men-of-war as "sea devils," against whom it was impossible for mortal men to contend.

I slept at Shun-chiang, a village of 200 houses, which is perhaps the principal place in Hsi-lien. This district consists of a plain or plateau about 23 miles long running from north to south at an elevation which averages 6000 feet. The northern half runs down the Ku-tung Ho, and is from one to three miles wide. This river then turns off eastward to join the Shweli, and the southern part of Hsi-lien is a plateau with little tributaries of the Ku-tung Ho or of the Shweli, crossing it from west to east. Along these little streams are irrigated fields, so that in going up the plateau from south to north one crosses alternately small rice plains and bits of higher-lying uncultivated ground, covered with rocks and bushes.

The hills all round are fairly well clothed with forest, chiefly of fir trees. The range to the west rises to 9,500 feet, but that to the east is lower, with gaps through it by which the streams reach the Shweli[1]. The abundance of timber is shown by the fact that all the houses are built of wood instead of the usual soft brick. The district is decidedly a prosperous one and contributes to the volume of trade to be got out of T'êng-yüeh. Fruit-growing and sheep-rearing could be carried on very successfully here.

From Shun-chiang we went on by two easy marches to Ma-li-pa, a village in the small district of T'ien-t'ang-kuan which lies at the head of the Ku-tung Ho. Here we found shelter for mules as well as men in a water-tight but very draughty temple. The district is governed by an hereditary Chinese chief, and is of no importance except for its iron mine. This has been worked chiefly by surface-diggings, but in two places there are deeper shafts, the earth being propped up by logs of wood placed close together and supported by posts. One of these goes down forty or fifty feet.

The ore is smelted near the village, and the bellows of the furnace, as at Wan-yao, are worked by a water-wheel. The softer iron is used for the manufacture of pans, but

[1] Some of these streams run into holes in this range.

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CHAPTER XVII

YUNG-CH'ANG-FU TO TAW-NIO AND KUN-LONG.

Through fir woods to Niu-wang—The Shih-tien plain—Yao-kuan—A temple of hideous images—Hilly going to Mêng-po-lo—Cotton grown—Mêng-p'êng—The Miao tribe—A crop of oranges—The British frontier post at Taw-nio—Meeting with Captain Johnson—No news of Turner and Ker—The Taw-nio district—The fort—Sport at Taw-nio—Theft by my servant—Kun-long—Tracking elephants—Arrival of Turner, Ker, and Scott.

000 LEAVING Yung-ch'ang by the south gate, we made two short marches through undulating country covered with fir woods to the large village of Niu-wang, where I found the inhabitants particularly inquisitive.

•241 The next day our road lay through the very fertile plain of Shih-tien. This, like Yung-ch'ang and many other places in this part of Yün-nan, produces two crops in the year. The rice is harvested about October, and then the winter crops of opium, beans, peas, or wheat are put in. The Shih-tien plain also grows excellent tobacco and sugar-cane. [346] We slept in a fine temple with a nice flower garden, and the walls ornamented with realistic pictures of the punishments in the Buddhist hell. The Hsün-chien, the small official here, was very friendly, and the people consequently as civil as they had been the reverse at Niu-wang.

From the Shih-tien plain an ascent of 1000 feet brought us on to a plateau country, with little hills covered with fir trees rising out of it 200 or 300 feet above the general level. [241] In the hollows between these run little streams, along which are narrow strips of rice cultivation and a few scattered villages. At night we reached Yao-kuan, a large village, whose inhabitants allow their sense of curiosity to get the better of any small stock of manners that they may ever have possessed. We slept here in a temple which possesses the finest collection of hideous images that I have ever come across. [p. 130]

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nothing was missing. Neither Ker nor I had been very favourably impressed with the appearance of our Panthay hosts of the afternoon, and we had a shrewd suspicion that some of them had paid us this midnight visit, though certainly there was nothing to prove it. 000

On the 20th we descended very steeply to the Mekong, but left the river again immediately by an equally abrupt ascent on to another spur, whence we again went down into the valley of the small Kung-lang river, which is followed up with a good deal of up and down to the village of that name. Here the valley widens out into a quarter of a mile width of paddy fields. The place contains about 80 houses and is the residence of a small official, a *hsün-chien*. The population of the village is Chinese, but the surrounding country is inhabited by P'u-mans and Lo-los, the former near the river, and the latter on the higher hills. Our road on this march had been even narrower than usual, with rocks jutting out in places. No less than seven of our mules fell down the hillside, but no greater damage was done than the smashing of a bottle of brandy.

We were now again on the high road from Yün Chou to Ta-li, which we had left at Mêng-lang. Three more days of the usual hilly marching took us to Mêng-hua T'ing. The top of the range to the south of this place is 8,500 feet, where our route crossed it, and from here we had a fine view of the town and plain beneath us, and of the snowy mountains of Ta-li beyond. Descending into the plain we passed some hot springs, with a large bathing tank. Where the water runs out of this, all the stones and earth are covered with a white salt-tasting deposit of which the water is evidently full.

Before entering the town we crossed a shallow sandy stream by a three-arched brick bridge. This is the head waters of the Red River of Tong-king. Mêng-hua contains about 1000 houses and is surrounded by a good stone wall. It has always been, for some reason or other, rather an anti-foreign place, and inn-keepers were not at all anxious to receive us. However we forced our way in, and the good man of the house thought it best to acquiesce in a *fait accompli*.

The plain like many others grows two crops; beans and opium are produced in some quantity. [241] 10—2

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312 had been passing through are, as far as I could see, entirely watered by lakes and ponds: there do not appear to be any running streams. They are much less fertile than the valleys further west, no doubt in consequence of the increased difficulty of irrigating the land where no running water is available.

136 What these plains lack in fertility is from the sportsman's point of view abundantly made up for by the quantities of geese and duck which one finds in the lakes. There were flocks of bar-headed geese all over the plain, and one could walk right up to within twenty or thirty yards of them before they would rise in a leisurely manner. Out of one flock I got six. Two fell to my first two barrels as they rose, and then the flock after flying round a short distance twice, again came over my head at close range, enabling me to get two more each time. This will seem incredible to those who know that very wary bird the wild goose, but I remember in India once, in the Aligarh district, finding a flock of these bar-headed geese equally tame. There was no sport in this, so when I had killed fifteen—enough to feast our followers for two or three days—I gave up shooting them.

However tame the geese may have been, the duck, though numerous, were by no means easy to get within shot of. The mallard and teal seem to be the commonest on the large lakes, and that small black and white duck called the tufted pochard on the smaller ponds.

From Mu-pang-p'u to Chên-nan Chou we took four days, moving very slowly, as Watts-Jones often had to leave the road and ascend hills so as to get a better view of the country. Our road led us at an average height of 7000 feet through a sandstone plateau country, with small hills rising up out of it, very dry and bare except for a few 241 little fir trees. Villages are not numerous, and the cultivation is chiefly confined to strips of beans, opium, and wheat along the narrow valleys.

000 Just before reaching Chên-nan Chou we had made a halt to put up the plane table, when Ryder suddenly appeared coming in by a road from the north. So after being separated for three and a half months we hit each other off to a yard. He had gone from Li-chiang eastward

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000 it on our right, passed through the village of T'ang-ch'ih, in the middle of which is a hot sulphur spring and a bathing-tank, much frequented by the rheumatic. After this we crossed another range, and descended steeply to the Yi-liang plain, which lies at 5,300 feet, an exceptionally low level for this part of Yün-nan.

361 [436] The town contains about 800 houses and is surrounded by the usual wall, but most of the inns and shops are in a suburb outside the north gate. Their cotton and foreign goods reach them through Tong-king, and the only important local product is opium, which grows well here. The place is usually called Ni-liang by the Yün-nanese, and locally it is also known as Mi-liang.

The next day at the far edge of the plain we forded a river 70 yards wide, which runs down from Ch'ü-ching Fu, and then ascended on to a large plateau over which our route lay for the rest of the way to Lu-liang Chou.

133 This plateau ends to the north in a precipitous descent to the Ch'ü-ching River[1], while to the south the haze prevented me from seeing how far it extended. The general elevation averages well over 6000 feet, and it undulates so gently that carts are used all over it. There are a few fir trees in places, but the general character of the country is very bare and dry, with little rocky mounds rising out of it. Great pillars of sandstone rock 15 or 20 feet high standing in groups form a curious feature of the landscape, and might easily be taken for ruined buildings when seen in the distance through the haze. The crops in this plateau are very poor and scanty: opium seems to grow better than anything else.

•[241]

000 After two days and a half over this somewhat monotonous country, we again reached the Ch'ü-ching River. Crossing it by a fine thirteen-arch stone bridge, 120 yards long, we soon entered Lu-liang, which lies a little higher up on the right bank. The river here has a slow current and a depth of apparently three or four feet, but lower down between here and Yi-liang it seems to run in a deep gorge, and I could hear of no road up its banks in this part of its

[1] I do not think that the Chinese call the river by this name in this part of its course, but as it runs down from Ch'ü-ching Fu, I have thought best to so name it.

5: Davies G-5 (1894-1900) 1909 AF16 Southwest China AF16

course. This river I should mention is one of the sources of the West River of Canton.

Lu-liang Chou is one of the poorest towns I have seen, and is rather unlike the ordinary Chinese city, for, though it has a wall, the houses are much scattered about and the place is full of trees. There are scarcely any shops, and the people depend for their buying and selling on a market which is held every five days.

In spite of its poverty the town has a considerable reputation for scholarship, and many of its inhabitants are able to display over their doors the tablet which shows that they have taken a literary degree. We slept in a temple which an enterprising man had turned into an inn, and we were glad to find a watertight roof over us, for a very heavy thunderstorm burst in the evening.

From Lu-liang two level marches up the plain, through which the Ch'ü-ching River runs, brought us to Yüeh-chou. This is the place from which Momien derives its Chinese name of T'êng-Yüeh[1]. It still has walls round it, but is not now an official city, and much of the space inside it is taken up by fields, the main street of 200 houses being all that remains of the former town.

The next day, the 10th April, we reached Ch'ü-ching Fu, where I was hospitably entertained by Mr and Mrs Allen of the China Inland Mission. The town, which stands at a height of 6,450 feet, contains about 1000 houses, and lies in one of the finest plains in Yün-nan. The plain is continuous from beyond Chan-yi Chou, a town lying north of Ch'ü-ching, down to below Lu-liang Chou, a total length of 50 miles, with an average width of five miles. The upper half of this plain, down to below Yüeh-chou, is very fertile, but nearer Lu-liang there are not so many irrigated fields and the crops are poor. I saw oats growing in one place near Ch'ü-ching, a crop I had not previously noticed in Yün-nan. I think it is only cultivated in the north-eastern part of the province.

Ch'ü-ching lies a little off the main road, and is not therefore a great trading place. Its principal industry is the weaving of cotton cloth from Indian yarn, which is im-

[1] See p. 45.

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CHAPTER XXII

FROM WEI-NING CHOU BACK TO YÜN-NAN FU *VIÂ* TUNG-CH'UAN FU.

Part from Watts-Jones—Watershed of the Yangtze and the Canton River—A mass of steep hills—White wax insect—The Niu-lan Chiang—Zinc smelting—Kung shan—Lead, silver, and zinc mines—Tung-ch'uan Fu—Weaving—Copper mines—The Yi-li Ho—A high plateau—Wooded country—Curious rice husking machine—Cuckoos—Hsün-tien Chou—Sung-ming Chou—Lose the way—Reach camp at dark—A country full of pheasants—Reach Yün-nan Fu—Meet Ker—Results of his explorations—Ryder's movements—Arrival of Turner.

WATTS-JONES and I left Wei-ning on the 27th April. Our roads were the same for the first five miles, leading along the northern bank of the Wei-ning Lake, till we crossed its outlet by a bridge at Ta-ch'iao. Here we separated. My road led over undulating ground among clumps of fir trees to the little village of Shuang-lung-ch'iao where I pitched my tent.

On the 28th 18½ miles of hilly marching, over a country sparsely inhabited by Lo-los, brought us to Ch'ing-mo-ti. The next day we crossed a range at 8,150 feet and descended by a path, the last part of which was almost precipitous, to the small village of Ch'ia-hsi-ho.

The ridge crossed on this march is a spur running out from the main range which lies a few miles to the south and forms the watershed of the Yangtze and the Canton River. I do not think I have ever seen such a mass of steep broken hills as this country presents. The hill-sides are very barren and dry, and many of them are too steep to be climbed, so that the roads have to follow the beds of streams. Maize is the chief thing grown by the few villages that there are.

This was the first district in which I came across the white wax insect: most of the villages about here rear

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328 the cup near the top. The zinc is sold at about 1½d for 1 lb., and is most of it sent to Yün-nan Fu to be mixed with copper to make cash.

After crossing the river we had a very steep climb of more than 3000 feet, reaching the top of the range at 8,600 feet and descending slightly to Kung-shan, a large mining village. The mine manager was a travelled man who had visited Shanghai, and I found him very civil.

316 Lead and zinc are the two chief minerals, and the lead ore also produces a small quantity of silver. I was told that the output of lead averages 400 lbs. in a day. The zinc is got out of very deep shafts, extending they say several *li*[1] into the hill-side. I did not test the exact accuracy of this statement, but I went a little way down one shaft and it certainly seemed to be a deep one. They are not sunk straight down but are sloped so that a man can walk down them, though the passage is so low that he has to keep in a bent position most of the way.

On the 1st May our road led us down a narrow valley to the Chê-hai plain, which is about seven miles long and contains a small lake and several villages. The next day after crossing a low range we reached Tung-ch'uan Fu where I was kindly put up by Mr and Mrs Grist and Dr Hicks,
288 the missionaries there. The official then at Tung-ch'uan was a very enterprising man who had established a manufactory of cotton cloth. The yarn is from Bombay, imported by Shanghai and the Yangtze. There was no European machinery: they used the ordinary Chinese looms.

361 The town walls of Tung-ch'uan do not enclose much space, but there are a good many people living outside the gates, and the whole town and suburbs must contain about 1000 houses. The population appear to be very friendly to foreigners.

241 The plain is some six miles long by three miles wide. It grows rice well, but the winter crops do not seem to
000 flourish, and the soil does not suit opium. Like Wei-ning

[1] The *li* is a Chinese measure of distance. Theoretically it is about 600 yds. but practically it varies in different parts of the country. In the hilly parts of Yün-nan it runs about five to the mile. Ten li may be usually taken as an hour's march, so that used in this way as a unit of time it is a very useful measure.

the chief importance of Tung-ch'uan lies in its mines. I had not time to visit any of these, except those at Kung-shan, but there are several productive copper mines in the district.

132 The height of the town I made 7,250 feet. It is a cold place, with a climate more cloudy and rainy than the parts of Yün-nan lying further to the south or west of it.

000 My route from here on to Yün-nan Fu took me along the main road which connects the Yangtze at Sui Fu with the capital of Yün-nan. I was here again out of unexplored country, as Doudart de Lagrée, Baber and others, not to mention many missionaries, had travelled the road before me. I still kept up the survey as no very satisfactory maps had been made of this country.

Turning off from the Tung-ch'uan plain near its western end, our road led us up the Yi-li Ho by a narrow valley
505 with hills rising to 9000 feet on either side. This river is 30 or 40 yards wide and is fordable in many places, but is deep enough to be navigated by boats which bring down timber and firewood to supply Tung-ch'uan.

000 Up this valley we marched for two days and then ascended very steeply on to a ridge and along it, the highest point reached being 9,300 feet. To the north-west a long distance off two very high peaks were visible which I estimated at 14,000 feet. We had now got on to a bare plateau country with considerable stretches of flat ground and small hills rising 300 to 500 feet out of it. We slept on the 5th May in the large temple of the village of Lai-t'ou-p'o at 8,500 feet.

• 241 The next day we continued our march over the same plateau country. Villages are scarce here, and there is very little cultivation owing to lack of water. At the end of this march of 18 miles the road descends to Hsiao-lung-t'an which is near a small tributary of the Yangtze.

On the 7th after descending to Kung-shan, our road led us up a narrow cultivated valley, ending with a slight ascent
137 to Liu-shu-ho. The country here is more wooded: the hills are covered with firs, and I pitched my tent in a grove of chestnut trees.

407 I saw a curious rice husking machine here. It consisted of a wheel in an upright position which wheeled round and

5: Davies G-5 (1894-1900) 1909 AF16 Southwest China AF16

000 between the little Chiang-ch'uan Lake and the hills to the east of it, just at the point where a stream connecting it with the Ch'êng-chiang Hai forces its way through these hills.

The village has some nice trees and looks well from a distance: inside are the usual pigs and dirt. Its height is just under 6000 feet, the first time for six weeks I had camped at such a low elevation.

On the 18th, crossing a low range of hills, we descended to the lake of T'ung Hai, and, rounding its eastern end, • 241 reached the town of that name. The plain round the lake 373 is well cultivated and there is a ring of large villages round it. The town though not very big is decidedly prosperous and has a good deal of trade. We found kerosine oil in general use here for lamps, a sign that we were approaching the civilisation of Tong-king.

From here Turner and I separated, his road branching off in a more westerly direction. Ker had left us two days previously to find a way from Chin-ning to T'a-lang, thus getting more country surveyed than we otherwise should have done.

316 Turner and Ker met at T'a-lang and were able to visit the gold mine, which they found a productive one in spite of the very crude machinery used. After this they had a most trying journey over roads rendered nearly impassable by heavy rains. They followed up the course of the Pa-pien Chiang (Black River) for several days, turning westward from near the south end of the Ching-tung T'ing plain. Ker crossed the Mekong to Yün Chou, and from there went northward to Ta-li Fu, where he met Turner, who had come there by a more direct route. They did not reach Burma till August. Travelling in Yün-nan in the rains is not a pleasant experience. It was quite an exceptional circumstance for them not to be wet to the skin on every march, and their rate of progress was sometimes not more than a mile an hour.

136 It had rained almost unceasingly since we left Yün-nan Fu, so it was pleasant to start the next morning in fine weather, with the cheerful call of the Chinese francolin all round us. This bird closely resembles the painted partridge of southern India, and is the common partridge of Burma

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nd of the Shan States and the lower lying valleys of Yün- 136
nán; but I have never before or since seen it at anything ike such a high elevation as 6,200 feet, which is about the eight of the T'ung-hai plain.

Crossing a range of hills we descended steeply down a 249
narrow gorge to the Ch'ü Chiang valley, which being only ,800 feet is warm enough to grow sugar cane, a valuable roduct in Yün-nan. The river which waters this valley is 000
00 yards wide and is fordable at this time of year, being lso crossed here by a wooden footbridge. Later on in he rains the water rises and mules have to cross by a ridge two miles lower down, just where the river leaves he plain.

I have reason to remember the footbridge, for the man who was in charge of my pony, so as not to wet his own eet, tried to lead him over the bridge. As it was made of narrow planks not very carefully joined together and the whole structure was decidedly shaky, the natural result was hat the pony fell off it when he had got half way across. t was an anxious moment when I heard a shout from ehind and looked back to see the pony hang for a moment nd then fall. Luckily he was not hurt, though there was a onsiderable drop.

Our hopes of getting through the day dry were dis- ppointed, as, before we could reach our night's quarters at Kuan-yi, a heavy thunderstorm burst, which wetted us to he skin in a few moments.

On the 20th May a march of 17 miles took us to Hsin- ang, a village in the Lin-an plain, where we put up in a emple. We were below 5000 feet here and in a much varmer climate than the traveller in Yün-nan is accustomed o, while the mosquitos reminded us that we were now in he rainy season. Luckily we had a clear night and I was ble to take the latitude, the only observation I got between Yün-nan Fu and Tong-king.

The town of Lin-an Fu lies five miles off the road to he south and I had not time to visit it, but I made a slight letour the next morning to the top of a low spur, and I was ble to fix its position.

The town is said to contain 1000 houses: it lies in 361
plain of considerable extent, but only narrow strips along 241

5: Davies G-5 (1894-1900) 1909 AF16 Southwest China AF16

the two streams that water it are irrigated: the rest of the plain lies too high and is consequently little cultivated. The natives of Lin-an, like those of T'êng-yüeh, have a strong antipathy to anyone who has not had the good fortune to be born a Chinaman. So far do they carry their hatred of everything foreign that they even refuse to weave their cloth out of foreign yarn. They import their material for making clothes in the shape of raw cotton from the Shan States. Such at least was the case at the time of my visit.

Three days from Hsin-fang, over a fairly open plateau country, brought us to Mêng-tzŭ[1], where I was hospitably entertained by Mr and Mrs Spinney of the Imperial Maritime Customs.

This place was only opened as a treaty port in 1889. The foreign settlement is pleasantly situated outside the town, the European community at the time consisting, besides the Customs Staff, of a French consul, a doctor, and one French merchant. The well-built, well-furnished houses in which they lived made one feel that one was in civilisation once more.

Mêng-tzŭ was considered a very quiet place, and the inhabitants of the town were extremely civil and fairly free from curiosity. But only a short time after my visit the Europeans there had a very unpleasant awakening from their sense of security.

In the middle of the night the foreign settlement was attacked by a large armed mob recruited principally from the workers in the Ko-chiu tin mines. The foreign community, among whom at the time were several French officers, concentrated in the French Consulate and made good their defence. The rioters, however, killed two Chinese servants and burned or carried off everything from the remaining houses.

Mêng-tzŭ is a busy place for Yün-nan, and even though the rainy season had begun I must have met quite 1000 loaded mules since leaving T'ung-hai. They were most of them carrying cotton yarn imported from Bombay *viâ* Hong Kong. This Indian yarn is cheaper than the Man-

[1] Sometimes spelt Mêng-tsz' or Mong-tze.

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241

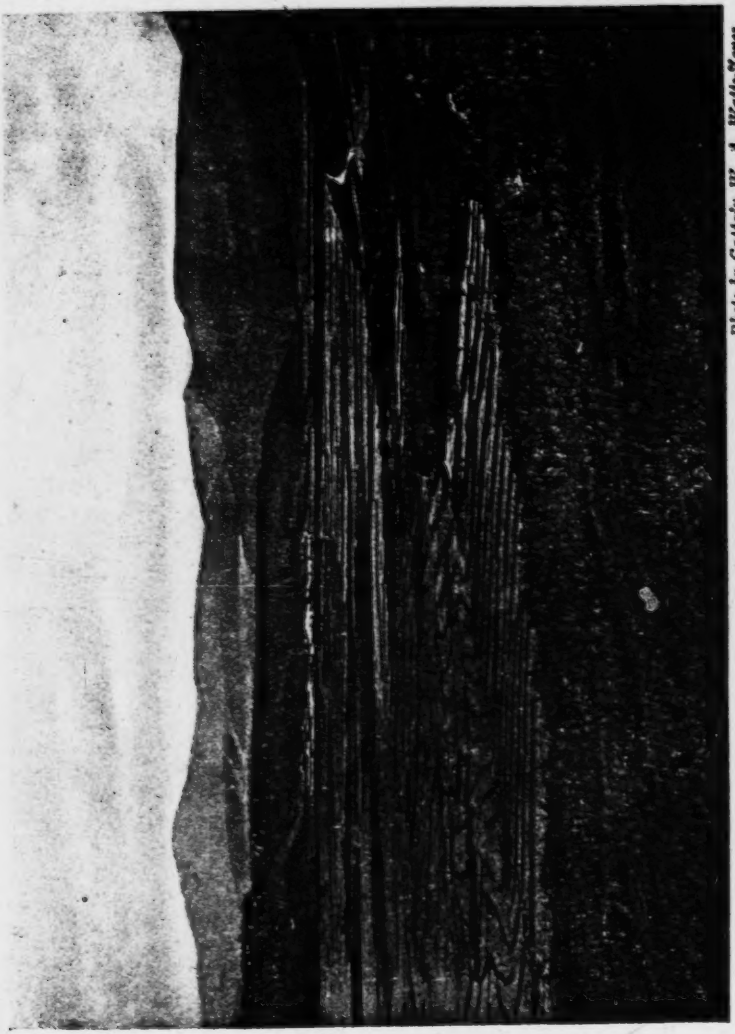

Photo by Captain W. A. Wallis-Jones

The Nan-tien plain

Plate XLIV

[Face p. 192]

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000 streets and crowded the house-tops to get a look at us. Work must have been entirely at a standstill for that afternoon. The crowd was however a very civil and friendly one. On arriving at the inn I found the enterprising landlord had arranged some reserved seats for his family and friends, so that they might watch whatever I did in my room. This was a little too much, and I was obliged to intimate that the performance was finished for the day.

361 The town of Hsin-p'ing is in two parts, one surrounded by a stone wall, the other by a mud wall. The officials
563 live in the former, but all the shops are in the latter. The people are chiefly Chinese, but there are a few Lo-los in almost every village and even in the town. Doubtless it was a Lo-lo country originally, and many of the Chinese are of Lo-lo descent.

•241 The plain is most of it on a slope and somewhat cut up by stony, uncultivated ground, but it appears to grow fairly good crops. Its height is over 5000 feet, and it is cool enough to grow opium and warm enough to grow sugar-cane, two crops that I have never elsewhere seen side by side. I bought here the best oranges that I have ever tasted in any country.

312 Our next three days' march lay through a poor country,
316 without much water in it that can be used for irrigation. The streams are most of them little trickles over a bed of solid rock, with occasional muddy pools. On the third day we reached Ssŭ-ch'éng, a village at 6000 feet, which has the remains of a mud wall round it. On this last march we passed a small iron mine at a place called Chia-tso. It is only worked on quite a small scale and does not appear to be very productive. Most of the ore is smelted near the mine, where they have enough to keep one small furnace going.

361 From Ssŭ-ch'éng, crossing two more ranges, we arrived at Yi-mén-Hsien on the 17th January. It is a very small place, the town walls built round a little hill which stands out in the middle of the plain. But inside the walls are only about 50 houses, two large temples, and the mandarin's yamen. Nearly all the population live in a suburb to the south of the real town. The plain is five miles long and is well cultivated.

5: Davies G-5 (1894-1900) 1909 AF16 Southwest China AF16

panthers' tracks. It is not often in any country that one would get such a good look at a tiger, and such an opportunity of observing his ways. 136

We were now well into the Chien-ch'ang valley. This part of it is not, however, a flat plain. In fact there is scarcely any really level ground, but between the hills on either side is a width of about a mile of gently sloping land which is cultivated in terraced fields. There are a fair number of villages, but this end of the valley does not strike one as extraordinarily rich. 241

We slept at Liang-lu-k'ou, a small village just opposite the town of Tê-ch'ang which is on the other side of the An-ning Ho, and is said to contain 700 houses. The river is here crossed by ferry in many places, and they were building an iron chain suspension bridge across it at Tê-ch'ang. 797

The next day I was overtaken on the march by a bearded horseman in Chinese dress whom I at once recognised as a French missionary. He turned out to be Père Bourgain who lives at Tê-ch'ang. We both slept at Huang-shui-t'ang, and had a very pleasant talk in the evening.

He is one of five priests who are established in this part of Ssŭ-ch'uan. They had had a good deal of trouble with the Chinese of this valley who are not very partial to Europeans, but the matter had been taken up and the missionaries had got the best of it, so the Chinamen were at present on their best behaviour. I certainly found them very civil the whole way up the Chien-ch'ang valley; and even in Ning-yüan Fu which has a very anti-foreign reputation I did not see any signs of unfriendliness.

Père Bourgain seems to have many converts, and has some even among the Lo-los, though he says it is very difficult to cure them of their habits of drunkenness.

It is impossible not to admire the zeal and unselfishness which induces the Catholic missionary to come to China there to spend the rest of his days in the cause of his religion, without any hope of ever seeing his native country again. For it is only in very rare instances that a Catholic missionary ever goes back to his own land. He makes up his mind from the beginning to live and die in China. Living alone, as most of them do, it is a very salutary rule that they have, that when possible every priest shall go and

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361 Mien-ning Hsien, there are three flourishing towns Lu-ku, Li-chou, and Tê-ch'ang, and a large number of big villages, many of which must contain some hundreds of houses.

•241 The whole of the plain[1] is fairly well cultivated. In the extreme northern part round Mien-ning there is not much rice grown, and wheat, maize, and opium are the principal crops. But through the greater part of the valley there is plenty of rice cultivation, while wheat, beans, and opium are grown as winter crops. The white wax insect tree and the mulberry as food for silkworms are also cultivated. Copper and iron are mined in the hills, and probably much more mining could be done if the Lo-lo country to the east of the valley were more settled. Coal is found in the hills east of Ch'i-lung, a large village a few miles north of Li-chou.

316

438 I met nothing in the way of trading caravans except [288] some native-made cotton cloth from Ya-chou Fu, carried in the Ssŭ-ch'uan fashion by men on foot, for mule or pony transport is but little used in this province. It is with this Chinese-woven stuff that the inhabitants of the valley are chiefly clothed. They find it cheaper, warmer, and more durable than the more finely woven products of England or India. No doubt much more trade passes along this road in April when the crops of white wax insects and opium are being gathered.

161 The whole population of the Chien-ch'ang Valley I estimate at 150,000. Though there are plains in Yün-nan which, both in riches and in density of population, would, in *proportion to their size*, compare favourably with this valley, yet there is certainly nowhere in Yün-nan such a large extent of well-populated country all in one plain.

672 At Lu-ku an unpleasant incident occurred. Lachman Jadu, the surveyor, had a lot of his things stolen out of his room in the inn. On a journey of this sort no one has any superfluous kit and the loss of almost any article is serious. By Chinese custom the innkeeper is responsible for any theft that takes place in his house, and accordingly I took him with me the next day and handed him over to the nearest official, the *Hsün-chien* at Mien-shan. As far as 000 I know the thief was never caught.

Following up the eastern source of the An-ning Ho

[1] [Chien-ch'ang valley -- Analyst]

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291 ually wear are made of felt and soled with leather. Our own boots were in a deplorable condition after 2000 miles of Chinese roads, and we were glad to be able to get such serviceable substitutes as the Tibetan article. They are not, however, altogether comfortable: the sole is so thin that every sharp little stone can be painfully felt through it.

435 We had brought with us some musical boxes and field glasses as presents to reward friendly individuals who might assist us in our travels, but we soon found that among Tibetans there was not the slightest prospect of finding anyone friendly enough to deserve a present. So we began to make use of these things in our horse dealing bargains. Two musical boxes and a pair of glasses was the price of a very nice pony we bought from one of the military mandarins.

132 The climate of Ba-t'ang we found extremely pleasant, very much like a hot summer day in England. During our stay the maximum temperature was 80° and the minimum 55°. The heat can never be very great in summer. Snow, they say, falls occasionally in winter but always thaws by the middle of the day. The place lies too high to cultivate rice, but wheat and barley grow well, and peach trees appear to thrive. We made the height 9,300 feet by both aneroid and boiling point thermometer. This is considerably higher than the observations of other travellers. Desgodins gives 8,065 feet, Rockhill 8,223 feet, Bower 8,500 feet, and Gill 8,546 feet[1].

[241] 133

758 The inhabitants of Ba-t'ang we found quite pleasant, and Manifold made them still more friendly by performing several operations for cataract. After the first patient—an old woman—had been successfully operated on and found she could see again, there was quite a run on Manifold's services and he restored the sight of seven people altogether. There was some danger that the patients would be too anxious to use their eyes again and would not keep them bandaged for the necessary four days, but we heard afterwards that all the operations were successful.

[1] Hosie, however, who has visited Ba-t'ang since we were there, makes the height 9,184 feet.

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APPENDIX III

THE CLIMATE AND PRODUCTS OF YÜN-NAN.

In so large a province the nature of the country and the crops grown, naturally vary somewhat, but except in the north-west corner there is a sufficiently close general resemblance between other parts of Yün-nan. 132

Let us deal first therefore with this north-west corner which in the nature of the country and of its inhabitants is purely Tibetan, forming with western Ssŭ-ch'uan that part of Tibet which is directly under Chinese rule.

Southwards the Tibetan tract extends to about the 27th parallel of latitude. North of this line is a country of very high mountain ranges, the plains even rising to from 8000 to over 12,000 feet. The climate here is naturally colder than other parts of Yün-nan, and where heights extend from 6000 feet on the river banks to over 15,000 feet on the hill-tops, it varies much in different places. At the higher altitudes snow may fall in any month of the year, and many of the passes are liable to be blocked throughout April. In the plains the climate is less severe, but except in a shut-in river bed it never becomes hot.

Parts of this country, especially the tops of the mountains, are bare and barren, but a great deal of it is clothed in fine forests of cedar, fir, and other trees. Rice cultivation hardly exists here: even the plains are too high and cold to grow it. A certain amount of maize is cultivated, but even for this a fairly warm climate is necessary, and the bulk of the crops consist of wheat and barley. Peach, walnut and other fruit trees also exist. 241 137

The cereal products of this part of Yün-nan are however scanty and poor. It is essentially a grazing country, for good grass is to be found nearly the whole year round. 233

7: Hu K-5 (1934-) 1946 AF16 Southwest China AF16

166 the neighboring provinces of interior China. The influx of these heterogeneous groups of immigrants brought with it many ideas and practices to help in the adjustment of the people to their new environment, particularly in connection with agricultural and forestry land use. This fact helps to explain the present heterogeneity of the agricultural landscape of the Basin.

463 439 Agriculture and forestry are the outstanding features of the economy of the Szechuan Basin. Approximately 85 per cent of the people gain their livelihood from agricultural pursuits. In terms of exports from the Basin, however, the leading item, Tung oil, is a forest product. Most of the other exports are either agricultural or forestry products.

• 241 312 In so far as agricultural land use is concerned, nowhere else in China except in Szechuan Basin does one find terraced fields so extensively, elaborately, and finely made, and irrigation systems so greatly diversified and ingeniously devised. The Basin is almost literally a country of "millions of minute steps" and a land of "thousands of small ditches." The terraced fields and the irrigation ditches, together with the hard-working peasantry have helped to transform the otherwise hostile rugged Szechuan Basin into a smiling garden.

Other unique features of the Basin's agricultural land use include the age-old but the recently much publicized Tung Shui Tien (winter storage water field) system; the cultivation of Tsai Seng Tao (double-growth) variety rice; the numerous special methods of soil culture, fertilization, composting, and crop rotations; and the various elaborate systems of inter-culture and synchronization of crops.

133 As has been implied, the Basin is a natural unit. Its combination of surface, climate, soil, and drainage is unlike that of any other part of China. In large measure, the interior of the Basin within the mountainous border is made up of hill country which varies from hilly areas of low relief in the south to the fairly high parallel anticlinal ridges in the east and to a border of complex hills at the north. Near the western edge of the Basin, the hills give way to the Chengtu Plain, a broad piedmont alluvial plain, the most productive part of the Basin.

132 Climatically, the Basin has a phase of the "humid subtropical" type of climate.[1] The Basin extends from latitude 28

[1] G. Trewartha, An Introduction to Weather and Climate, Plate I, 1937.

7: Hu K-5 (1934-) 1946 AF16 Southwest China AF16

134 brown" type soil is rich in mineral foods but rather low in humus content and is shallower in depths than the soils of the Chengtu Plain. However, on account of the hilly nature of most parts of the Basin, soil characteristics vary greatly in different local areas.

311 In many ways, the distribution of agriculture and forestry
241 and the features associated with these uses of the land are related to and conditioned by one or more of the natural elements characterized in the foregoing paragraphs. Forests mantle the
[137] mountain slope, and tree crops are characteristic of many of the hillsides. Agriculture dominates the Chengtu Plain, and is conspicuous along the numerous valley floors and on the terraced hills.

133 Of all the natural elements at work in the Basin, topog-
311 raphy is a highly important factor that affects the agriculture land use and other forms of cultural life, and the adjustment to this natural element is especially conspicuous. First of all, the close correlation between the cultivated-land index and the topography is most striking. In general, there is a consistent tendency for the cultivated-land index, and the population patterns as well, to decrease from the center of the Basin to the peripheral highlands. Second, the adjustment of the Basin's set-
361 tlement forms to the topography is outstanding. As in most parts of China, about 85 per cent of the population of Szechuan Basin is rural. But unlike any other part of China, there are comparatively few large villages and nuclear hamlets, with the exception of the Hsien[1] capitals. This remarkable fact is largely a result of the rugged and extremely dissected topography of the Basin. The settlement forms have had to adjust to the local topography. This is particularly true in the eastern and northern parts of the Basin.

312 In the agricultural adjustment to water resources and drainage patterns, the following examples may be noted. First, by seizing the torrential flow of the Min River, the Basin has built not only the oldest but also the most successful and easily-maintained irrigation system of all China. This system has freed the Chengtu Plain from the hazard of floods and droughts, and has insured the unbroken agricultural prosperity of the Basin. This

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[1]Hsien or district in China corresponds somewhat to the county unit of the United States.

823 The Basin has often been referred to by western writers as "the Eden of the Flowery Republic," or the "Garden of Asia." By the Chinese themselves, it is popularly called the "Tien Fu," which literally means the "Treasury of Heaven." Although these ●241 names may appear exaggerated, they do suggest the agricultural 433 richness and the amazing diversity of the products of the Basin. Normally, Szechuan Basin leads all China in the production of corn and rape. It holds second place as a producer of rice, potatoes, and silk; fifth place, as a producer of wheat; and sixth, as a producer of millet, kaoliang, and soy beans. The Basin has been for decades unchallenged as a producer of such internationally known products as tung oil, bristles, herbs, Cho Tsai (pickled vegetables), Wu Pei Tze, and Nanmu (lumber).

The agricultural richness of the Basin and the important role it now plays in China's present war effort are demonstrated by one significant fact. The Basin alone contributes about 60 per cent of the total food supply for the entire Chinese fighting force, comprising over five million men. The Basin is truly a granary of all free China.

314 In forestry land use, the Basin normally produces about 433 a third of the total annual production of tung oil for all China. This product constitutes a critical cash crop for farmers in many parts of the Basin, particularly in the hilly east and southeast. At present tung oil occupies a vitally important position in the export trade of the Basin. It, alone, comprised about 65 per cent of the Basin's total export trade in 1940.

[388] Another important forestry product of the Basin is white wax. The Basin normally produces over 90 per cent of the total white wax of China. Although the economic value of this unique forestry product is not great, the spectacular snow-white color of the wax tree in the late Autumn adds much to the picturesqueness of the Basin's agricultural landscape.

[386] Lacquer derived from the varnish tree, has been famous in the Basin ever since the Han dynasty (206 B.C. to 220 A.D.). It still remains one of the Basin's most reputed products.

135 The variety and abundance of strategic minerals in the Basin is second only to its richness in agricultural and forestry products. Today the Basin leads all China in the production of brine salt. Its iron reserve ranks second and its coal reserve ranks third in the country, but it is at present the leading

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722 As a result of the recent barbaric Japanese invasion of China and the great influx of modern people and ideas from down-river into the Basin during the past few years, a renaissance has begun in Szechuan Basin. The Basin is now undergoing an economic awakening. It is in a state of rapid transition, induced and intensified by the exigencies of the war.

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654 Since the migration of the National government into the Basin, every possible means has been utilized and every feasible
241 plan is being drawn up to increase the efficiency of land use in the Basin. Mention may be made of a few striking examples.

In agricultural land use, various measures have been devised to cope with the inefficient traditional Tung Shui Tien field system; the acreage in Tsai Seng Tao variety rice has been extended; cotton culture has been expanded; the cultivated acreage of herb plants has been increased; more modern sugar refineries have been built, experimental stations have been established, and a number of new varieties of sugar cane have been introduced; silk-culture has been organized and operated on a more scientific basis; a number of tea-growers' cooperatives have been found recently; and above all, the practices in fertilization, terracing, erosion control, and irrigation works have been improved.

178 With the introduction of more modern methods of processing, the numerous agricultural and forestry products of the Basin are being put into more efficient utilization. The increasing manufacture of alcohol and wines from grains, the making of charcoal from wood, and the preparation of synthetic gasoline from tung oil are notable examples. These innovations not only meet the various emergent war needs, especially that of fuel supply, but also help to solve the still difficult transportation problem by transforming the bulky agricultural and forestry products into lighter and more transportable forms.

313 In forestry land use, significant improvements have already taken place. A number of large corporations, financed either by government or private interests, have recently organized to survey intensively and to exploit systematically the rich forestry
314 resources of the Basin. Numerous attempts have been made to improve tung tree production, including the establishment of more tung tree plantations and experimental stations, the supply of modern equipment, and the efficient organization of marketing facilities. Besides, the recent completion of the west branch of

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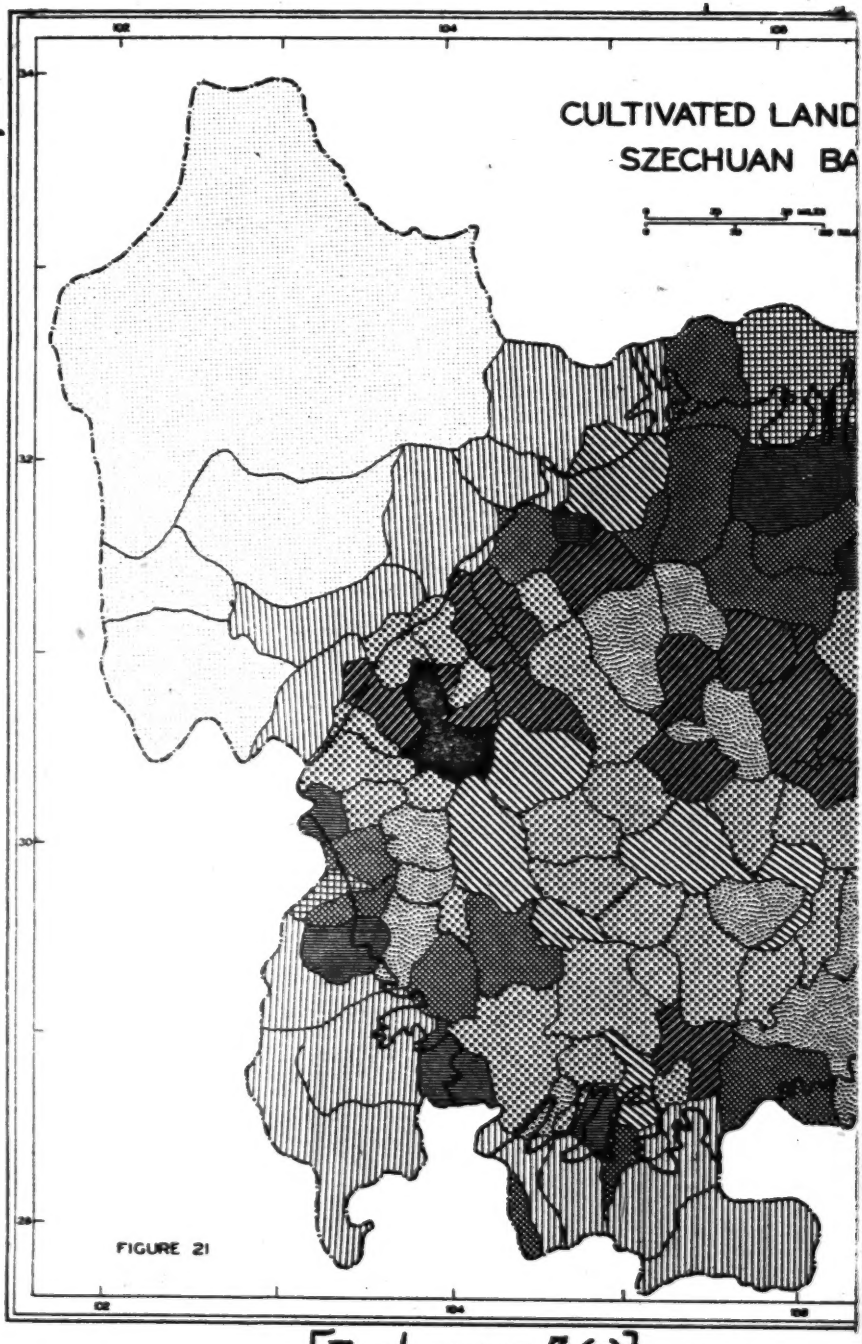

[End map 8(a)]

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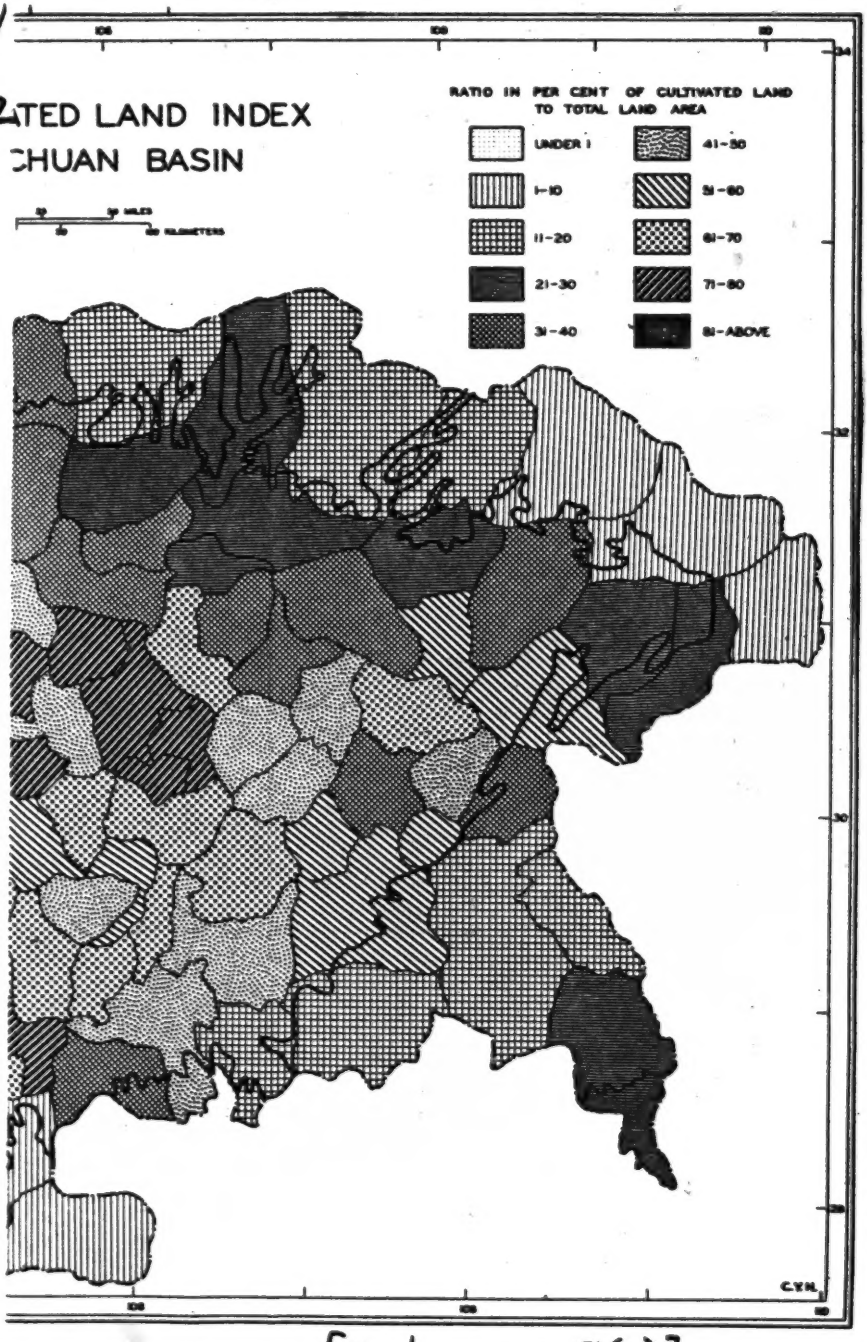

[End map 8(b)]

7: Hu K-5 (1934-) 1946 AF16 Southwest China AF16

the Szechuan-Yunnan highway will relieve to a considerable degree the traditional difficulty of transporting the wax insects for the white-wax tree industry. 314

In both mining and manufacturing, rapid progress has also been made. During the past few years, the Basin's coal production has been increased 400 per cent, iron production 300 per cent, and placer mining 200 per cent. Besides, the Basin is rapidly developing into a new industrial center of free China. It is now the home of over 61 per cent of free China's machine industry. At present the Basin accounts for about 40 per cent of the total manufacturing capacity of all free China. 316 178

Even in the most chronic and difficult problem of transportation land use, rapid progress is being made. Numerous commercial air lines have been inaugurated since 1932, many railways (some of them already under construction) have been projected; and the highway network of the Basin has been partly completed. Of the Basin's 136 districts, 85 districts, or 62 per cent, now have highway connections. Most important of all, the various projects for canalization of the numerous streams in the Basin have been vigorously advanced. Many of these projects (such as the Chi and Upper Chialing rivers) have already been completed. These achievements and many more to follow will make a long stride toward the satisfactory solution of the Basin's acute transportation problem. 489

As to the future development of the Basin, one may approach the problem from two standpoints: first, the future prospect of the Basin as a base of operation against the Japanese invasion; and second, the future position of the Basin when peace returns once more. 133

As regards the first objective, the future of the Basin is bright. First of all, here, in Szechuan Basin, one finds a unique geographic region which has the interesting and fortunate combination of a mild south-China climate (with a long growing season), a rich north-China mineral resource (particularly coal and iron), a Yangtse Delta agricultural wealth, and above all, a southwest-China rugged mountain topography which provides protection against military invasion. The agricultural richness of the Basin is particularly important in maintaining a sustained self-sufficiency and should enable the region to hold longer against invading forces than would otherwise be possible. 241

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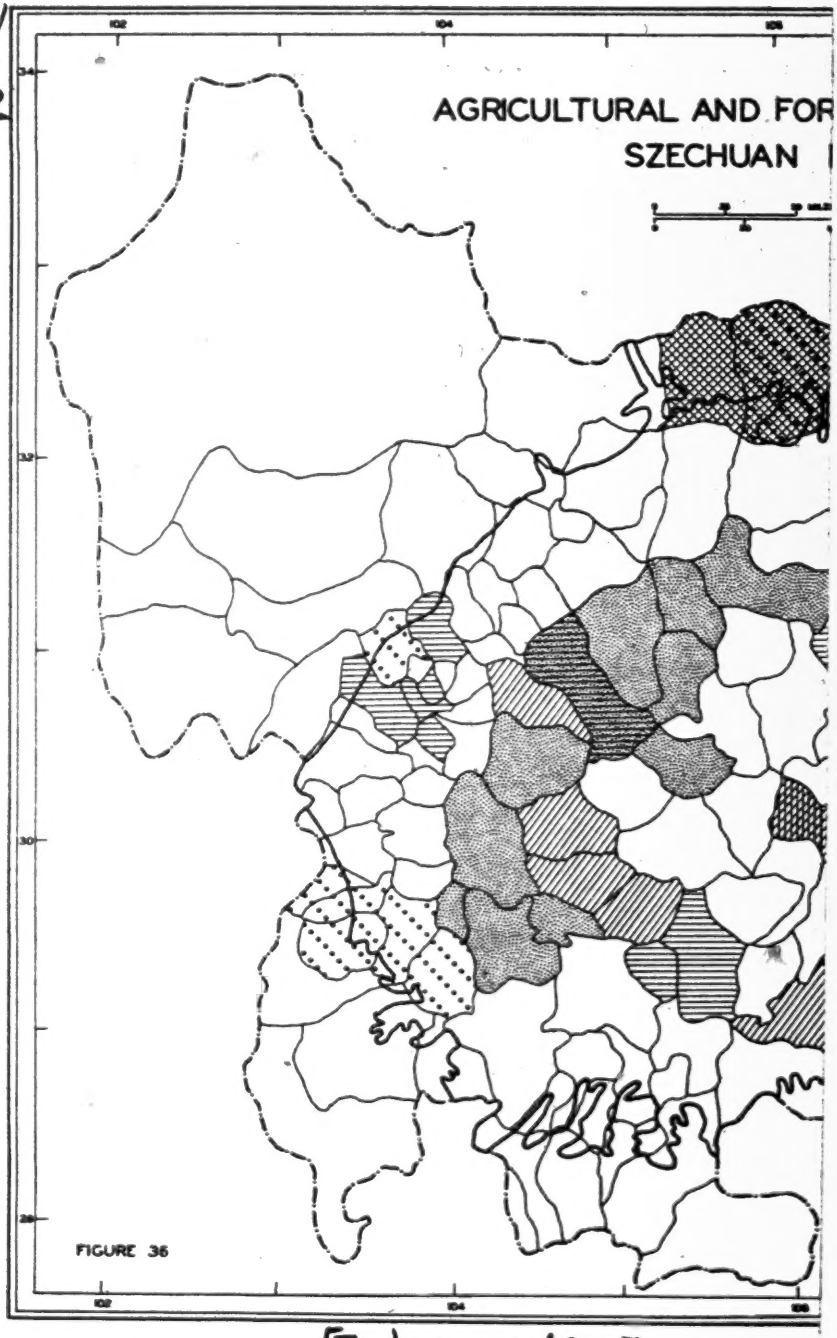

FIGURE 36

[End map 10(a)]

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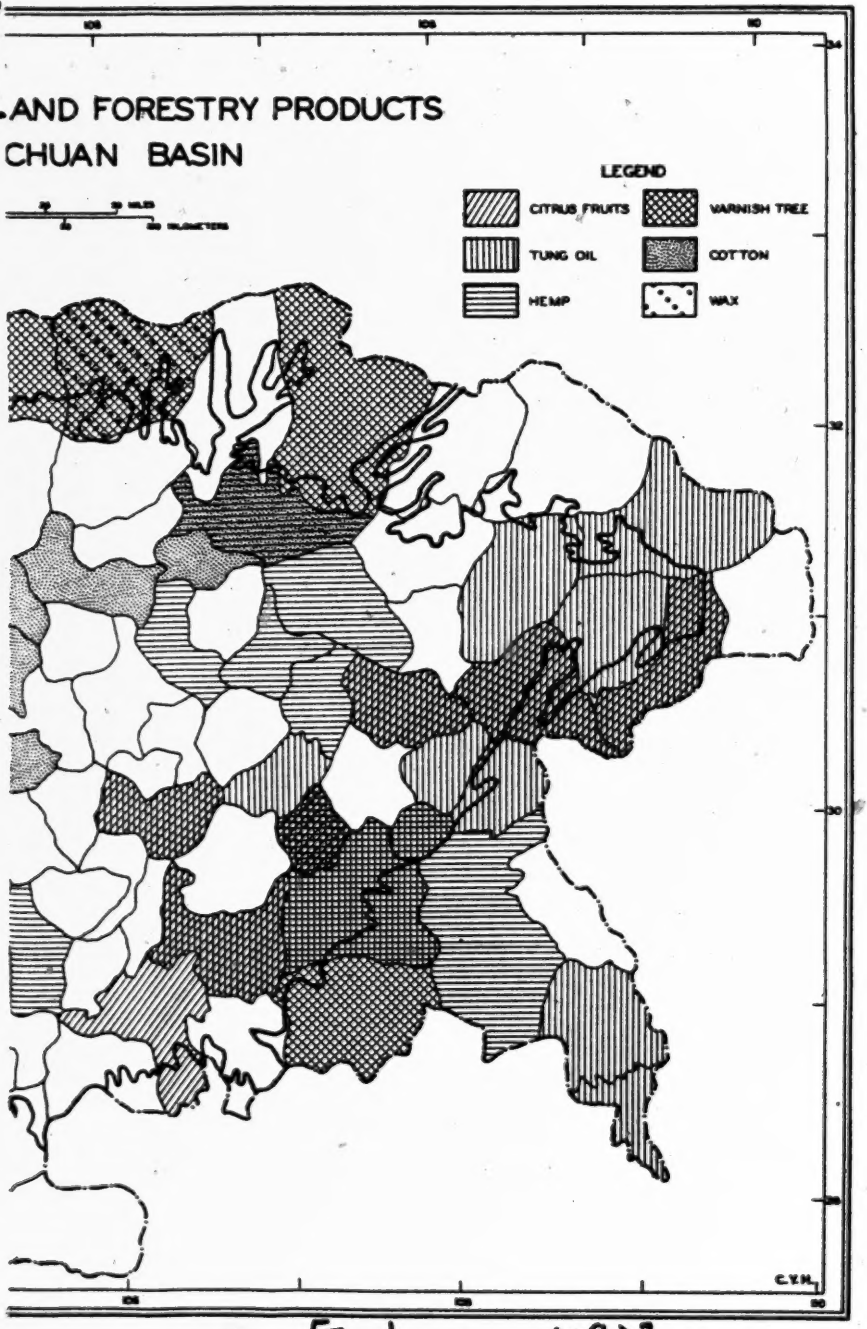

[End map 10(b)]

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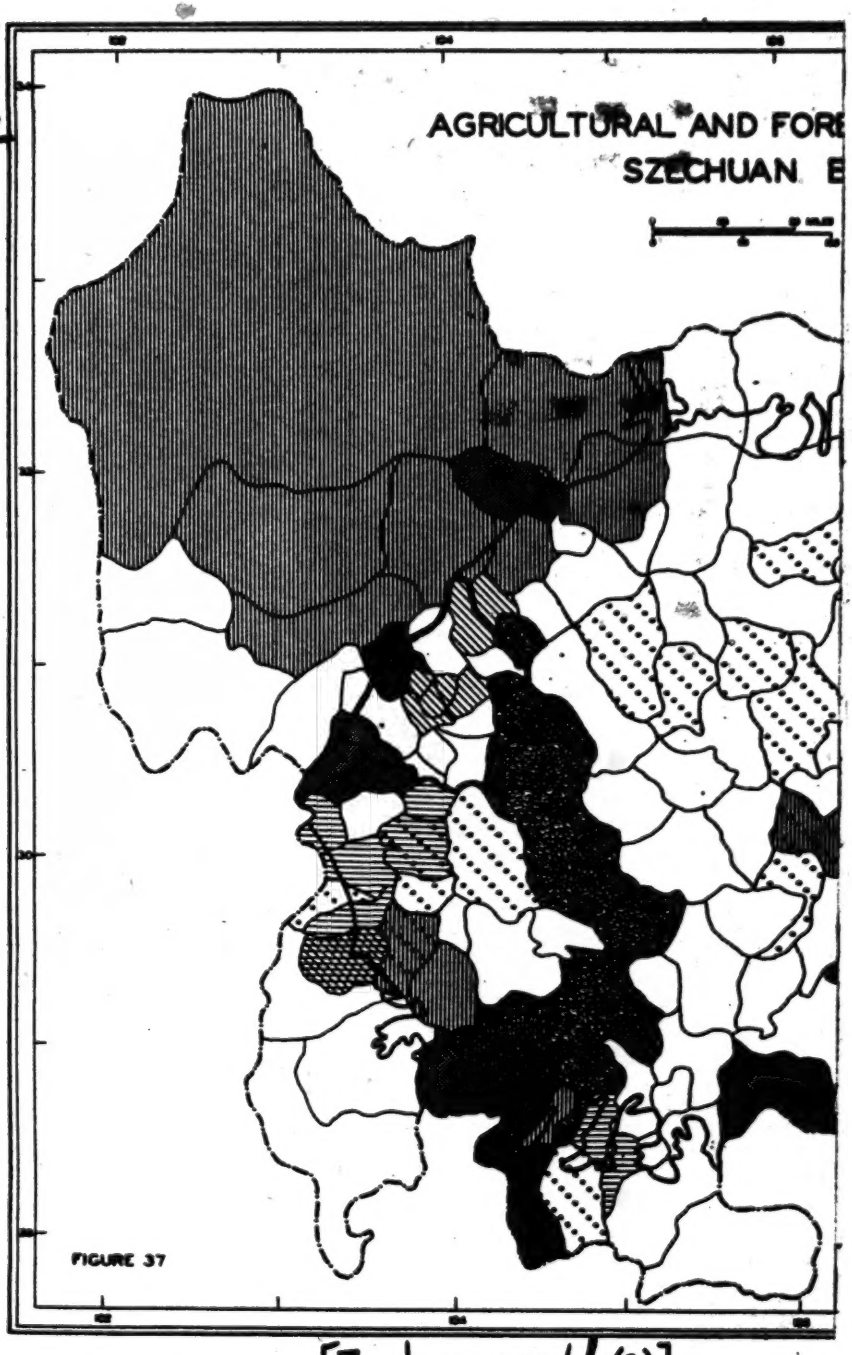

[End map 11(a)]

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frequency of fair days is so adjusted as to reduce competition among the neighboring localities and to afford the greatest advantages to both buyers and sellers. The smooth operation of these schedules illustrates the type of local cooperation which is common in this part of China.

The typical village fair includes a grain merchant, a butcher; several tea houses, a few oil merchants, some firewood booths, vegetable booth, poultry stands, wandering native doctors, dentists, and fortune tellers. In spite of the extremely small area occupied by the fair grounds, it is interesting to note that a kind of system of automatic zoning has come into effect. For instance, it is almost a rule that the grain markets are located at the temple or other spacious grounds, whereas the tea houses, fortune tellers, and the wandering native doctors and dentists always occupy the center areas of the fair.

4. Farms and Field Patterns

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One of the most striking features of the farms of the Basin is the predominance of terraced cultivated fields. Probably nowhere else in all China--with the possible exception of the loessial northwest--does one find the use of slope lands and the building of terraces so universal and so highly perfected as in the Szechuan Basin. Most of the low, round, amphitheater-like hills of the Basin are terraced and cultivated.

The terraced steps are of various widths. Each terrace rises above the preceding one (Fig. 15) and in many cases is faced by a wall of bare sandstones or shales. Each terrace is irrigated from the one below by a small stream of water regulated generally by some simple lifting device, such as a windless, driven by men or animal power. Generally speaking, most of these terraced fields are irregular, depending upon the specific land forms. In Chengtu Plain the fields tend to be rather square or oblong in shape, but most of them have irregular forms, owing to the need of fitting them into irrigation systems. In general, the units of the fields in Chengtu Plain, on account of its more continuous flat topography, are much larger than those in other parts of the Basin.

In the Basin, all land to be planted in rice, whether terraced or otherwise, is put, if possible, under water--generally a little over one foot deep--for the rice season. The field boundaries in most cases follow the natural elevations.

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241 *If one may admit color as one of the elements of the* landscape of a region, one certainly cannot ignore it in the agricultural landscape of the Szechuan Basin. In fact the unusual combination of color in the agricultural areas adds much to the charm of the Basin. The bright red, purple, and chocolate-tints of the soil, the fresh-green of the grain crops, vegetables, and flowers, the brilliant yellow of the rape, the white-but-spattered-with-yellow-and-pink flowers of the tung trees, the snow-white color of the white-wax trees, and many other colors silhouetted against the ever-present dark-green background of the luxurious vegetation throughout the Basin, all add to its special picturesqueness.

231 The normal assortment of livestock life on the farms is a second noticeable feature of the rural scene in the Basin. Fowls, geese, ducks, pigs, bees are especially prevalent. Horses and mules are few. Oxen and water-buffalos are the most important animals on the farm. The buffalos particularly serve in various capacities, such as to plough and to burrow the rice fields, to mill the grains, to press the oils, and to perform a hundred and one other duties. Aside from human beings, they are really the other important "flesh-motors" of the Basin. On the farms, herds and herds of such bulky, slow-moving, long-horned buffalos may frequently be seen (Fig. 16).

235 Duck rearing is another activity of importance (Fig. 17), particularly in the Chengtu Plain. During the months of November and December one may see enormous flocks of ducks being driven slowly over the flooded paddy fields of Chengtu Plain. They feed on the aquatic life in the waters as they are driven along. In two or three months the flocks arrive at Chengtu, fat for market, and at no one's expense!

5. The Character and Distribution of Cities and Towns

361 One of the outstanding features of the urban settlements of the Basin is that most of the relatively important urban units of the Basin are situated on the terraces near the banks of the principal streams (Fig. 7). For instance, beginning from Fengchieh up to I-ping, following the Yangtse Valley, one may count no less than fifteen of these urban units, including the most populous cities and trading towns of the Basin (Fig. 7). The

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CHAPTER III

AGRICULTURAL LAND-USE

Agriculture is the principal form of land-use of the Szechuan Basin. Among all the agricultural regions of China, the Basin is not only one of her richest regions but also, with its greatest diversity and widest range of agricultural products, the Basin represents almost a miniature China. Moreover, it is estimated that approximately 85 per cent of the people gainfully employed in the Basin are engaged either directly or indirectly in agricultural pursuits.[1] In the present treatment of the problem of agricultural land-use in the Szechuan Basin, major attention will be directed to the following points, namely, the land as chief natural resource of the Basin, distinctive features of its agricultural land-use, agricultural land-use in relation to natural elements of the Basin, the principal agricultural areas of the Basin, and the Basin's chief agricultural products.

A. Land: Chief Natural Resources of Szechuan Basin

1. Cultivation-Index and Areal Pattern Thereof

According to the latest report of the Bureau of Military Surveys of Szechuan Province, the total land area of the province is 360,159 square kilometers.[2] The area of the Basin as delimited in the present study is 146,842 square kilometers. The total area under cultivation, for the province as a whole--according to the report (1939) of the Bureau of Central Agricultural Research--is 103,632 square kilometers (Table 2); for the Basin proper (as delimited) it is 68,240 square kilometers. This means the province as a whole has a cultivation-index (ratio of cultivated land to

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[1] Bureau of Interior Affairs, Szechuan Provincial Government, Population Statistics (1937).

[2] Szechuan Provincial Government, Report of the Bureau of Military Surveys (1939).

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total land area) of about 30 per cent, whereas the cultivation-index for the Basin proper runs slightly over 45 per cent. Considering its hilly and dissected topography, this cultivation-index figure for the Basin is fairly high, in fact it compares favorably with some of the flatter and more fertile areas in other parts of China.[1]

The cultivation-index, however, varies greatly in different parts of the Basin. Some areas have an index much higher than 45 per cent, whereas other districts fall far short of it. The peripheral areas of the Basin have a rather low index, ranging between 11 and 20 per cent (Fig. 21). In Chengtu Plain the cultivation-index runs as high as 70 to 80 per cent. In some of the districts of the Plain, particularly in Pi-hsien, Hsin-ching, Wen Chiang, Shuan-liu, and Hua-yang in the southwestern part of the Plain, the figure is even higher than this. On the other hand, in many other districts, including Pei-chuan, Ping-wu, Miao-hsien, Cheng-ko, and Fu-hsi in the northern, northwestern, and northeastern fringes of the Basin, the cultivation-index runs as low as 3 to 5 per cent. Between these two extremes, most of the south central and eastern parts of the Basin have an index ranging between 30 and 50 per cent. Generally speaking, the cultivation-index of the south central districts is somewhat above the general average for the Basin as a whole, whereas the eastern districts fall short of it. The districts on the northern, northeastern, and eastern fringes of the Basin, such as Kuang-yuan, Nanchiang, Wan-yuan, Yun-yang, and Feng-chieh, which have an index of 15 to 20 per cent (Fig. 21), are far below the general average for the Basin as a whole.

These differences in the cultivation-index are clearly explainable if one bears in mind the layout of land forms of the Basin. As in the case of population pattern, the factor of topography plays a very important part. It is almost startling to note the high degree of coincidence which the three maps showing relief, population density, and cultivation-index (constructed from three different sources of data) bear to one another.

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[1] Buck's study reports that the cultivation-index for the Yangtse Rice-wheat area as a whole is 35 per cent, but for the Yangtse Delta alone, the figure is 100 per cent (op. cit., p. 68). In the same study, Buck reports that the cultivation-index for the North-China Plain to be 68 per cent (op. cit., p. 62).

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2. Major Types of Land-Use

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a) General statement.--Concerning the classification of main types of land-use in the Basin, there are no official statistics available. It is, however, estimated[1] that 32 per cent of the total land area is used for farming and its related purposes; 22 per cent for forests, brush, and other undergrowths, particularly bamboo; 3 per cent for graves and graveyards; 2 per cent for pasture; 2 per cent for grasses grown for fuel; 2 per cent for temple grounds; and 37 per cent for miscellaneous uses (including "huang-ti," wild lands or waste lands). These estimates, although no better than cautious guesses, do furnish a general picture as to land-uses and their relative significance.

To a western student of agriculture or geographer this relatively high percentage of total land used for graveyards and temple grounds, and this extremely low percentage in permanent pasture, may seem incomprehensible. Probably here lies one of the most fundamental differences not only between Chinese and western agricultural systems, but also between the two respective cultures. The high percentage of wild or waste land is also striking. This is partly a result of the rugged topography, limited water supply, and poor soil conditions in many sections of the Basin. It also is partly, perhaps mainly, a result of the incessant civil warfare which has prevailed in the Basin during the last twenty years. This misfortune has laid waste to thousands of acres of productive farm lands, and has rendered farm economy bankrupt.

b) Uses of crop land.--It is reported that the total land in crop in the year 1937, for the province as a whole, amounted to 108,174,564 mow (one mow equals one-sixth of an acre), of which 44,952,366 mow, or 43 per cent, were used for "shui-tien" (irrigated fields) or rice paddy fields, and 63,222,198 mow, or 57 per cent, for "hang-tien" (unirrigated fields) or dry-crop lands.[2] With the exception of Chengtu Plain and some other minor river valleys, such as the To and Fou, where a large portion of the crop lands are used for irrigated paddy fields, most of the districts of the Basin, particularly the hilly areas, are generally occupied

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[1] Bureau of Reconstruction, Szechuan Provincial Government, Land Statistics (1937), pp. 83-85.

[2] Bureau of Reconstruction, Agricultural Section, Szechuan Provincial Government, Crop-land Statistics (1937).

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by "hang-ti" or unirrigated "dry" fields.

Dividing the total crop area by the total number of people in the province gives an average of about 2.5 mow of crop land per person. This is very small. It is also calculated that the average size of farm in Szechuan is about 16.3 mow,[1] which is slightly smaller than the average farm in north China (say, for Shantung province, 19 mow), but is much larger than the average size of farm in south or central China (say, for instance, Hunan province 12 mow).[2] The size of the average agricultural land-holding reflects the medium position of the Szechuan Basin.

The most interesting thing about these farms in the Basin lies, however, not so much in their small size but rather in the manner and the intensity with which they are being used. According to Buck,[3] 89.3 per cent of the total farm area in the "Szechuan Rice region" is used for crops; 4 per cent for farmsteads; 4.7 per cent for roads and graves; 0.7 per cent for wooded pastures; 0.7 per cent for forests; 0.4 per cent for pasture land; 0.1 for productive water area; and 0.1 for fuel grasses.

B. Distinctive Features of Agricultural Land-Use in Szechuan Basin

Nyhus, in his study of agricultural regions of China, classified Szechuan as the "west China" region.[4] Buck grouped Szechuan as the "Szechuan Rice" area.[5] Both of these classifications are widely known in the west and have often been quoted in western geographic literatures.[6] However, both of them seem to neglect the most unique features of agricultural practice in the

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[1]Buck's finding for the "most usual size" of farm in the "Szechuan Rice region" is 2.4 acres, or approximately 14.4 mow, which is slightly lower than the figure arrived here (op. cit., p. 269).

[2]Bureau of Statistics, National Government, China, Agricultural Statistics (Nanking, 1933), p. 41.

[3]Buck, op. cit., p. 172.

[4]Paul O. Nyhus, Agricultural Regions of China (Bureau of Agricultural Economics, U.S.D.A., 1931) (maps).

[5]Buck, op. cit., p. 27 (map).

[6]G. B. Cressey, "The Agricultural Regions of Asia," Economic Geography, Vol. X (1934).

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Basin. Particularly, Nyhus' classification of Szechuan as the "west China region," which includes large heterogeneous areas with diversified agricultural practice (for instance, Yunnan), fails to bring the agricultural land-use of the Basin into a sharp focus. Buck's treatment, in spite of the rich quantitative data he assembled, is handicapped by the lack of sufficient descriptive materials. Statistics alone, without comprehensive case descriptions, furnish only a dry skeleton which is of limited interest. In his contact with the agricultural practice in the Basin during the past years, the author feels there are a number of unique agricultural practices in the Basin which deserve special mention.

1. Extraordinary Diversity of Agricultural Products and Intensity of Land-Use

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First of all, the agricultural system of Szechuan Basin is marked both by its extreme diversity of products and by the extraordinary intensity of its land-use. Although the Basin is generally noted and is commonly classified as a "rice region," (and rice is undoubtedly the predominant crop here), a more characteristic feature of its agriculture system is the production of many other unirrigated crops, particularly corn, potatoes, kaoliang, and millet. Nowhere in China, perhaps with the possible exception of Yunnan and Kwangtung provinces, have corn and potatoes become so significant in agricultural production as in the Basin. Moreover, nowhere else in China, perhaps beside the North China Plain and Manchuria, have kaoliang, millet, and soy beans been so widely cultivated as here. It is even more surprising to note that horticultural products so diverse as Lung yen (Euphoria longana), li chi (Litchi chinensis), sugar cane, and citrus fruits of tropical south China, and the best quality pears and persimmons of temperate cold north China are all found growing together here. Agriculturally and horticulturally, here in the Basin, one finds all of China represented in a miniature form.

2. The "Tung-Shui-Tien" System

Another characteristic agricultural practice here is the so-called "Tung-shui-tien" system, literally meaning "winter-storing-water field." In spite of the favorable climate and the fertile soil, and contrary to the popular belief of many western agriculturalists and geographers, large tracts of "ti-tien,"

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• 241 terraced fields (estimated as high as 25 to 50 per cent of the total rice fields) are left fallow during the whole winter season. They are used for storage of water needed in the paddy fields the following spring. This peculiar situation is brought about by at least three factors: (a) Topographically, most of these "ti-tien," terraced fields, are of fairly high elevation, ranging from 50 to 100 meters or higher, and to secure water for irrigation is rather difficult. Thus it is found necessary to collect and store enough water at the lower terraces whenever possible during the winter for the spring crop. (b) On account of the mild climate of the Basin, and the lack of snowfall, the larvae of some harmful agricultural insects cannot be frozen to death. Storing water on the fields helps to kill off the insect pest for the spring crop season. (c) Because of the difficult transportation conditions and the prohibitive cost of transporting bulky fertilizers (consisting mainly of night soils and oil cakes) from one part to another within the Basin, and in order to conserve soil fertility and to safeguard a satisfactory summer crop, it is imperative to let these terraced hilly fields lie fallow during the winter season.[1]

This unfortunate age-old practice of the Basin has hampered greatly the efficiency of its agricultural land-use. During recent years, many modern Chinese agriculturalists have seriously challenged the wisdom of this inefficient practice. Numerous suggestions have been made to correct it. One of the most interesting methods[2] recently devised is the construction of high retaining walls around these water-storing fields so as to increase their

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[1]Mr. E. F. Chen, of the College of Agriculture, University of Nanking (now at Chengtu), has recently conducted a series of experiments for testing the efficiency (in yields) of land-use on two sets of such terraced lands--one on which water was stored and which allowed to lie idle, while the other was cultivated. He found that fields in fallow gave a 69 per cent greater yield. This result, of course, seems to give an experimental justification for this peculiar practice. It is, however, only the result of a single experiment, and cannot be said to be the last word on this whole important problem. It is perhaps necessary to continue such experiments on various types of land with different physical qualities over a period of years before any significant conclusions can be drawn (cf. China's Soil Quarterly, I, No. 3 (1941), 33-38.

[2]L. F. Chao, "The Present Conditions and Future Programs of Agriculture and Forestry of Szechuan," Southwest China Review, III, No. 1 (1941), 17.

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capacity to hold water. By so doing, considerable horizontal space (terraced fields) can be saved and made available for winter crops. 241

3. Rotation Systems and Inter-culture

Third, although inter-culture is an old favorite agricultural practice, universally adopted in all parts of China, nowhere does one find its practice so extensively carried out and so religiously followed by farmers as in this region. For instance, in cotton culture, the inter-planting with beans, corn, and other field crops, has been followed so extensively that it has almost ruined the cotton plant itself. Many agriculturalists have even cited this factor as one of the most important in the decline of cotton culture here. It is not unusual to observe, even on the tops of narrow dikes separating the rice fields, single rows of beans or other crops. Another common practice in inter-culture here is to plant beans, peas, or rape between rows of wheat.

4. Methods of Fertilization and Soil Culture

In most areas of the Basin, the purple-brown soil is only moderately fertile. In order to assure a good crop, fertilization is essentially necessary. There are a number of methods of soil fertilization practiced in the Basin. First of all, manuring is practiced at all times for all crops. Nothing is wasted which would tend to enrich the land. Sewage from cities and villages is carried long distances in buckets or in tubs to the fields, and nowhere else in the world is human excrement so highly valued and laboriously collected as is in the Basin. Besides, stable manure, potash-burned stubble, roots, weeds, rice husks, animal hairs, and anything that is otherwise valueless is collected and heaped together for purposes of fertilizing the soil.

The methods of fertilizer composting used here are different from those used in many other parts of China. The general procedure is to put all waste organic matters into a large heap, and to moisten the heap slightly to permit decomposition. Usually this slow decomposition takes months. But, recently, special yeast bacteria have been developed by the Bureau of Central Agricultural Research to hasten this process. Now it takes only three

●241 weeks for decomposition.[1] By this method very little nitrogen is lost. The heap may be turned several times until the decomposition is complete and the fertilizer is ready for use in the field. Moreover, this process also increases the efficiency of the fertilizer in its usefulness to the plant.

Again, the manner of application of the fertilizer here is perhaps even more painstaking than the ways of preparation and composting. Sometimes a cupful of liquid manure or night soil is given to each plant at the period of its critical growth so as to secure the maximum efficiency.

The Basin also produces a number of oil-yielding plants and trees, such as rape, ground-nuts, beans, sesame, cotton, tung tree, and others, whose seeds and nuts, after the oil has been extracted, furnish refuse cakes of great value for soil fertilization purposes.

Another characteristic practice here is the widespread use of green-manuring by applying a special species of legume plant, locally known as "lu-tiao," (astragalus sinenses). This practice is particularly popular with farmers near the Chengtu Plain. According to the reports of recent experiments, conducted by the Central Agricultural Experimental Station, this plant yields the highest nitrogen content of any fertilizer. The government has been trying to encourage more farmers both in the southern and central part of the Basin to adopt this practice.

Second, soil culture has been widely practiced in the Basin. One practice is the so-called "Tiao-ho-po," which literally means "clean left-overs of the river banks." During the winter, in the low-water season, farmers living along the numerous small river valleys gouge the river bank and carry back to their fields in baskets the overflowing alluvial deposits. Due to the steep slope of many terraced fields and the high tilting of the rock structures, soil creep is very common. Thus a considerable portion of rich organic matter and surface soils from the hilly areas have been slipped down to lower land levels. It is a common scene to see farmers salvage these "fugitive soils" caught in pockets at the lower hillsides due to summer freshets or other erosional forces by carrying them back (during the summer season) in baskets to their upper hill fields. In many occasions one may find farmers

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[1] Ibid., p. 21.

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actually paving the bare rocks with fresh soils they have secured from the river channels and trying to grow crops on them. This is bona fide soil culture. Consequently, the soil profile here is very confused so that any use of it as a criterion for soil classification is most difficult. In fact, in many places here, soils are almost completely lacking in any profile. It is certainly no exaggeration to say that considerable areas of soil here are, either directly or indirectly, humanly induced.

Moreover, on account of the shallowness of the soil and the soft friable character of the underlying cretaceous shales and sandstones, the farmers, in their everyday operations actually dig into the underlying rocks to hasten their weathering and decomposition so that more fresh soils can be "cultured."

5. Special Terracing Practices

Probably nowhere in China has a higher and more extensive utilization of slope land been made than in Szechuan Basin. Most of the hillsides are terraced into a series of gigantic steps. Many mountains have been terraced up to the summits. These terraces are commonly long narrow strips of land, and in many cases have rather steep slopes. Sometimes land with slopes as high as 60 degrees or more is terraced and used for cultivation. Intricate irrigation systems are established between these terraces. Whenever water is available, rice is cultivated in the fields. Praising these practices, one competent and sympathetic western observer once remarked:

> These devices (terracing), combined with the untiring, patient industry of the people, have converted an incipient "bad land" into a rich and fertile region of terraced fields. In no part of China that I have visited are the people entitled to greater praise for their meritorious agricultural accomplishment than throughout this Red Basin.[1]

However, on account of the steep slope of many of these terraced fields, as well as the failure to practice contour-planting, serious soil creep has been induced. This constitutes one of the most serious forms of soil erosion here.

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[1] Wilson, op. cit., I, 67.

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(3) The "Lung-ku-chiao" or "dragon-bone-chariot" irrigation method.--In areas where the water flow is not sufficient to turn water-wheels, the old "dragon-bone-chariot," or the foot-power water elevator, which is found in many other parts of China, is used. It is a long, narrow wooden trough affair, open at both ends, with one end submerged in the water, and equipped with a chain of wooden pedals. It is a sort of step-up device, like a western escalator, operated by the foot-power of usually two or more persons. The water is lifted from one field to another of higher level. This device is also commonly used in hilly areas to lift water between terraced rice fields. It is particularly popular in the Kuang-hang and Te-yang districts.

(4) Storing-water-field or reservoir field irrigation.--As already explained, throughout the hilly areas of the Basin, it is a common practice to store water in fields during the winter season for spring or summer crops. As rainfall in the Basin is highly seasonal, some reservoir for the run-off from the immediately adjacent hills is necessary. Certain fields, in hollows well up the sides of slopes of terraced lands, are set aside as reservoirs. They are kept as nearly full as possible to tide the farmers over the periods between rains and between crops. This method, of course, necessitates the husbanding of all the rain water and run-off during the fall season in order to lead them into these field reservoirs.

(5) Ditch or canal irrigation.--This method involves the tapping of a stream at its upper reaches and then branching it into multitudes of anatomized channels and ditches for irrigation purposes. This system is by far the most important in the Basin. It is practiced in a number of river deltas, such as the To, the Fou, and the Min. The outstanding example is the Tu-chiang-yen works (Fig. 28) on the Min River in Chengtu Plain. A detailed discussion of this great work and its significance to the agricultural land-use of the Basin will be made later in connection with the agricultural area of Chengtu Plain.

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D. Principal Agricultural Areas of Szechuan Basin

On the basis of crop association, relative prosperity of agricultural production, general appearance of agricultural landscape, use of water for agricultural purposes, and the degree of commercialization of agricultural production, the Basin may be

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roughly divided into five principal agricultural areas (Fig. 24), 2410
namely, (1) the general grain farming area of Chengtu Plain; (2) the specialized "commercial" agricultural area of lower To-Fou valleys; (3) the self-sufficient subsistent agricultural area of the northern Basin; (4) the combined agricultural and forestry area of the eastern Basin; and (5) the mixed farming area of the southwestern Basin.

1. The General Grain Farming Area of Chengtu Plain

Among all the five agricultural areas of the Basin, the general grain farming area of the Chengtu Plain is by far the most important. Here the principal crops are rice and wheat, supplemented by rape seed and tobacco.

As the heart is to the human body, Chengtu Plain is to Szechuan Basin. Chengtu Plain is one of the richest, most fertile, and best known geographic regions of all China. With its mild climate, level topography, fertile and self-renewing soil, the ingenious ancient irrigation systems, and the diversity of agricultural products, Chengtu Plain is destined to be not only the granary of the Basin but also the par excellence "Eden of the Flowery Republic." Strictly speaking, Chengtu Plain is a highly fertile level oasis within a huge "mountain-desert."

a) Name and location of the Plain.--Geographically, the 133
term "Chengtu Plain," by which this region is now known, is not accurate, and is, in fact, somewhat misleading. Chengtu, the capital and the wealthiest city of the whole Basin, from which the Plain now derives its name, is, in fact, an "effect" or a "result," but not a "cause." Strictly speaking, the "Plain" might be more correct, or even more appropriate geographically, to assume the name, "the Min River Plain." It is the presence of the mighty Min, with its incessant life-promoting water-supply and the rich alluvial deposits it brings down, that made the prosperity of the city of Chengtu and of the whole Plain possible. It is interesting to note that unlike historic events, geographic names do not always follow the law of "cause and effect." The river made the plain, and the plain made the city, but now the plain takes its name from the city.

Chengtu Plain is situated at the northwest corner of Szechuan Basin. It is formed by a complex of piedmont alluvial fans built by the deposits of the Min River. Physiographically,

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311 133 melting during the summer is reliable. At Kuan-hsien, where the torrent of the Min first enters the Plain and is taken under human control, the waters are divided into several large canals, each of which is subdivided in turn into innumerable smaller canals and ditches. The life-giving waters are impounded by dams, stone revetments, and other devices, and are held for irrigation purposes. The irrigation of the Plain has another advantage in that the soils are seldom troubled by salt and fine mud which often clog irrigated soils in other areas; because the considerable rainfall in Chengtu Plain, with an annual average of about 900 millimeters, is sufficient to prevent such clogging.

134 The soils of Chengtu Plain consist principally of the dark and dark-gray paddy soils. They are formed mainly from alluvial deposits brought down from the rich black soil (chernozem) of the Tibetan border-land and Kokonor (Fig. 9) by the mighty Min River. The natural richness of these soils is enhanced even further by the annual renewal. Because of this fact, soils of the Plain, unlike the paddy soils of many other parts of China, are not strongly podzolized.[1] However, the soil conditions do not appear to be uniform throughout the whole Plain. In fact, there are considerable differences in texture, color, and profile according to slight differences in local relief.[2] For instance, in the upper Min River region, as in Kuan-hsien, the soil texture is much coarser than in the lower Plain areas.[3]

One of the most interesting practices in connection with soil culture in the farms of Chengtu Plain, is the building of little stone wing dams or projections along the stream banks out into the water. Behind these projections, the streams, in the course of a back eddy, deposit silt and sand, which are frequently rich, particularly in organic matters. All these mud accumulations are carefully dug out and carried in baskets to the fields. Many times muddy waters have been led into basins or rice paddies in order that fine fertile silt might be precipitated on the fields.

241 433 d) Agricultural products of Chengtu Plain.--The Plain is noted for its diversity of agricultural products. It produces

[1] Thorp, op. cit., p. 391.

[2] Ibid., p. 387.

[3] Ibid.

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three and sometimes four crops a year. It is estimated that the annual output of farm products alone include rice, 15,000,000 piculs; wheat, 8,000,000 piculs; other cereals, 2,000,000 piculs; rape seed, 500,000 piculs; tobacco, 700,000 piculs; plus medicinal herbs, vegetables, and other farm products. The total value of all these products at pre-war prices was a little over 180,000,000 dollars, or 45 dollars per capita for the Plain. This production represents about 15 per cent of the total volume of agricultural produce of the whole province, while the area of the Plain is only about one-sixty-seventh of the total area of the province. In other words, the Chengtu Plain produces ten times as much per unit area than the rest of the Basin.

e) Farms and fields.--Among the farm areas of the Basin, Chengtu Plain has the largest average farm. According to a survey by Professor Brown and M. L. Li, the rented farms average 30.1 mow, and the owned farms average 73.1 mow.[1] These figures are almost twice as large as the average size of farms in the Basin as a whole.[2] They are, in fact, even larger than the largest average size of farm in North China.[3] This, of course, means additional wealth and more prosperity. This undoubtedly has accounted for the large farmstead and the well-kept farms throughout the Plain (Fig. 12). Moreover, unlike other parts of the Basin, most of the farms here are not so detached. In general, the individual fields of Chengtu Plain farms are larger. According to the same survey, the average field is 3.36 mow,[4] which is three times as large as that of the hilly areas in the Basin.[5] Larger fields are made possible, of course, by the flatter topography and better water-supply here.

f) Marketing of agricultural products.--The marketing of the diverse agricultural products of the Plain is interesting. Marketing is done mainly in the nearby towns or cities throughout the year. The Plain is dotted with market towns, so that all

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[1] H. D. Brown and M. L. Li, "A Survey of Fifty Farms on the Chengtu Plain," Chinese Econ. Journal, I (1927), 1-59.

[2] Ibid.

[3] Buck, op. cit., p. 273.

[4] Brown and Li, op. cit., p. 28.

[5] H. D. Brown and M. L. Li, "A Survey of Farms of Mountain Omei Areas," Chinese Econ. Journal, I (1927), 1059-76.

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312 repairs, this Administration has also introduced numerous modern technological improvements in order to increase the durability and effectiveness of the project.

Recently, a hydrographic station has been established at the Erh Wang Shrine by the Administration to study the flow of the Min River. Projects are under way to harness the river's maximum flow of 9,500 cubic meters per second[1] to generate electricity for the Chengtu Plain. Two small hydro-electric plants are in operation at Chengtu and Ching-tang.[2] The Administration is contemplating building a 12,650 kilowatt power plant at Kuan-hsien. A 23-kilometer canal will be cut to link the Inner and Outer rivers between Wen-chiang and Chengtu to maintain the Chengtu city water-supply and navigation between the two rivers. The Administration also has plans for the dredging of the existing canals and the digging of new ones to control more effectively the flow in both rivers, and to repair the tributary creeks to increase by another 600,000 mow the farms irrigated by the system, and eventually bring the entire Chengtu Plain under irrigation.

Among all the geographic features of Szechuan Basin, the Tu Chiang Yen Irrigation Works holds the key to the sustained prosperity of the agricultural land-use of the Basin, particularly of Chengtu Plain. Indeed, it commands the special attention of all geographers.

2. The Specialized "Commercial" Agricultural Area of Lower To-Fou Valleys

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Comparing to the General Grain Farming area of Chengtu Plain, this agricultural area of Lower To-Fou valleys (Fig. 24) is noted by its specialized "commercial" products, such as sugar-cane, cotton, mulberry trees, and citrus fruits. About 85 per cent of the Basin's total production of sugar-cane, 65 per cent

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[1] Pao, op. cit., p. 48.

[2] According to the recent (1935) survey by Huang Hui, a prominent hydraulic engineer of the National Reconstruction Commission, it is highly feasible to develop multiple purpose water-power projects in the upper reaches of the Min, where the present source of irrigation water originates. These projects, if established, would also benefit the irrigation works, particularly by lightening the annual dredging work and reducing the operation costs (cf. section on "Potential Water-Power Development of Szechuan," Report of Chinese Engineer's Association Investigation of Szechuan (1936).

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of its total cotton, and 55 per cent of its silk are produced here in this agricultural area.

With its combined and greatly varied agricultural and horticultural products, this area compares favorably (in terms of agricultural prosperity) to that of the Chengtu Plain. But, however, unlike the Chengtu Plain, the agricultural land-use of this area is greatly handicapped by its insufficient supply of water for irrigation. This defect is largely due to the prevalence of the high porosity of the bed rocks[1] in this area, where water cannot be accumulated and stored up for irrigation purposes. This condition is especially detrimental to rice culture which requires flooded fields. Consequently, in many districts of this area, the plantation of rice is greatly limited. This factor, in turn, reduces considerably the agricultural prosperity of the area.

In so far as agricultural land-use is concerned, the adjustment to topography, soil conditions, and water supply here is conspicuous. In general, nearly all the alluvial lands along the river banks are used for rice, sugar-cane, cotton, mulberry trees, and other crops. On the saddle areas between hills, if the surface soil and bed rocks are not too loose or porous, paddy fields are always the rule. In the more hilly areas, where water cannot be stored for rice culture, potatoes, rape, wheat, kaoliang, and beans are the dominant crops.

Among all the agricultural areas of the Basin, this area of the lower To-Fou valleys is the most highly commercialized. For instance, in one district, Sui-ning alone, over 65 per cent of its cultivable land is devoted to cotton culture, whereas in Tze Chung district over half of its cultivated land is used for sugar-cane culture. In the actual rural economy, here, more than in any other agricultural area, farmers think more in terms of their "cash crops." This development brings up a very interesting problem in this agricultural area, that is, its insufficiency of food supply. Consequently, considerable amounts of foodstuffs are brought into here from the nearby Chengtu Plain area.

Other outstanding features of this agricultural area includes its high population density (Fig. 10) and rich salt deposits. [317]

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[1] T. S. Chen, "Geol. Structure of Central Szechuan," Geol. Bi-monthly, IV, No. 6 (1939), 55.

7: Hu K-5 (1934-) 1946 AF16 Southwest China AF16

3. The Self-sufficient Subsistent Agricultural Area of the Northern Basin

241 North of Santai in the west and Ho-chuan in the east (Fig. 24), almost in a straight line, lies the self-sufficient subsistent agricultural area of the northern Basin. This agricultural area is characterized by its more rugged and dissected topography, more irregular hills, and higher local reliefs. These conditions are particularly true in the northern half of the area at the vicinity of the upper Fou and Chialing valleys.

The most interesting aspect of this agricultural area, as its name implies, is its ultra self-sufficient and subsistent character of its agricultural practices. Although most of the agricultural areas of the Basin are principally subsistent in nature, the present agricultural area of the northern Basin represents the most extreme case.

Here, in crop association, no single crop is particularly predominant. Most of the farms produce a little of everything within a greatly varied assortment of crops. These crops are completely for home use. In general, potatoes, wheat, rice, barley, millet, rape, beans, kaoliang, corn are the common crops on farms. This peculiar situation is conditioned by two factors, namely, the extremely dissected topography and the peculiarly friable rock structure. The dissected topography causes the extremely detached character of the settlement forms (consisting of isolated farmsteads perched on various hillocks), whereas the friable rock structure with numerous fall lines, makes the available river transportation very difficult. Therefore, these conditions make it even more difficult for farmers in this area to communicate with the outside world and thus accentuate their self-sufficient agricultural economy.

134 The soil condition of this area is also interesting. With the exception of a few narrow detached stretches of alluvial soils along the river banks, and some yellow earths at its northern periphery, the soils of this area is consisted of principally the unique "purple-brown" type of the Szechuan Basin (Fig. 9). In fact, the distribution of this fertile soil here is so uniform and continuous that this self-sufficient agricultural area of the northern Basin should be properly called the "genuine" purple-brown soil region of the whole Basin.[1]

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[1]Chu, op. cit., p. 46.

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Another interesting characteristic of this agricultural area of the northern Basin is that this area is the most important producing center of a very important semi-agricultural product, the herbs, in the Basin. In addition to the meager subsistent agricultural production, the herb furnishes as a very important "cash crop" for the farmers. This is mainly due to the fact that in this area there are large tracts of land where the slope is too steep and the soils are too shallow for regular crop production. These lands are used, either in cultivated form or in "wild growths" for herbs.

Other outstanding features of this agricultural area include its moderate population density (Fig. 10), its specially thick cypress growths, and the conspicuous absence of coal, iron, nanmu, and pine vegetations.

4. The Combined Agricultural and Forestry Area of the Eastern Basin

In terms of both the agricultural prosperity and the general appearance of its agricultural landscape, this combined agricultural-forestry area of the eastern Basin (Fig. 24) is the least attractive and poorest. Here the topography is dominated by the numerous steep high parallel anticlinal ridges. Plains and gentle hills are even more restricted.

As to soils, in addition to the usual "purple-brown" type of the Basin, there are numerous tracts of soils, old and young yellow earths, which are derived from limestone parental materials. In most cases these soils are shallower in depths than the purple-brown type and are much slower in the rate of renewal. These factors handicap considerably its efficient agricultural production.

The principal crops here are potatoes, hemp, rice, corn, wheat, and kaoliang. Although rice is reported to be grown in every district of this agricultural area, its acreage is more limited here than in any other agricultural area.

The agricultural land-use of this area is controlled largely by its topography. Agricultural lands here are derived from two principal sources, first, on the manger-like trough lands at the top of the broad anticlines wherever the bed rocks happen to be less resistant than the surrounding structures. These trough lands are, however, rather restricted in extensions.

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241 311 Moreover, on account of the high ground water-tables here, the drainage conditions on these trough lands are very poor. These trough lands are sometimes used for wheat, hemp, rice, rape, or kaoliang, depending upon water conditions. But the productivity of these marginal agricultural lands are, in general, very low.

The second principal source of agricultural land-use here is developed on the more gentle slopes of the numerous synclines in this area. Here the slopes are terraced into rice, wheat, or potato fields. The drainage conditions are, in general, better than those in the trough lands of the anticlines. Considerable portions of the cultivated fields are used for Ta ma (hemp) and Tso Tsai (vegetable) cultures which are the two most spectacular agricultural products of this area.

314 The most outstanding feature of this agricultural area, as its name suggests, is the predominance of the forestry product, the tung oil. On the steep slopes or at the edge of the anticlines, where the soils are extremely shallow, great numbers of tung trees are planted. Especially during the past decade, stimulated by the increasing demand, the plantation of tung trees has been grown in leaps and bounds. This area alone now contributes about three-fourths of the total production of tung oil production of all the Basin. In one district, Ning-shui alone, it produces about 52 per cent of the total tung tree production of the Basin. This factor has increased greatly the population-support capacity for this agricultural area and also helps to explain the presence of a few detached high population density areas here (Fig. 10).

135 Another interesting characteristic of this agricultural area is that here lies about 65 per cent of the total coal reserve (Pa-hsien and Chiang-peh) and about 45 per cent of the total iron reserve (Chi-chiang and Nanchuan) of the whole Basin.[1] This remarkable fact suggests that in the future days to come, this agricultural area may abandon its present modest pursuits in agricultural and forestry production, and will soon take an unchallenged leadership in the growing industrial and manufacturing development of the Basin.

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[1] W. C. Chang, "The Iron and Coal Resources of Szechuan," Szechuan Monthly, V, No. 5 (1934), 35.

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5. The Mixed Farming Area of the Southwestern Basin

Among all the principal agricultural regions of the Basin, the mixed farming area of the southwestern Basin (Fig. 24) is the most interesting. Here lies an area like a synthesis of all the above four areas. Besides its own unique quality, as we shall see shortly, this area possesses some characteristics of each and every one of the above four agricultural areas. This condition is true in topography, soil, crop association, and other aspects.

In topography, for instance, this area possesses some of the anticlinal ridges (but lesser in magnitude) like the eastern Basin; some irregular hills like the northern Basin; and some broad plains (in smaller extensions) like the Chengtu Plain, or rather, like the lower To-Fou valleys. However, unlike all the above four agricultural areas, the absolute relief here is, on the whole, the lowest, averaging about 300 meters above sea level.

In soil, this area is also a miniature model of the above four agricultural areas. The usual purple-brown soils of the northern Basin, the limestone soils (old and young yellow earths) of the eastern Basin, and the rich alluvial soils of the Chengtu Plain and To-Fou valleys are all present here (Fig. 9).

In agricultural land-use and crop association this area has the greatest variety of products. The broad river valleys of the Min (lower) and Yangtse furnish fertile fields for rice, sugar-cane, and orange groves. The more hilly lands, terraced in minute steps, are used for corn, wheat, rape, hemp, barley, potato, beans, and other crops. Unlike the other four areas, corn is the most predominant crop here. Moreover, on the steep slopes of the high anticlines, or on other more hilly areas, numerous forestry products, such as tung tree, tea, white wax, mulberry trees, and various kinds of bamboo, are found. Especially, the bamboo products and white wax are the most famous.

Above all, another interesting feature of this area is the bona fide tropical character of its agricultural and horticultural products here. Climatically, with the exception of the southeastern highlands of the Basin, this area is the warmest among all the agricultural areas of the Basin (Fig. 24). Such well known tropical products as Li Chi, Lun yen, bananas, and palm vegetation are found here.

Another special feature of this area is the difference in its water use. Like Chengtu Plain this area is endowed with

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312 rich water supply by the Yangtse, the Min, and other rivers. Numerous channels are built here, for instance, such as the Wu Tung-chiao and Chien Wei districts. But contrary to the practice of Chengtu Plain, and for reasons unknown, very few of these channels are used for irrigation purposes. Instead, they are principally for transportation use.

135 Other interesting features of this agricultural area include its well-balanced endowment with mineral resources. Neither like the Chengtu Plain area of western Basin--where little or no mineral deposits are found--nor similar to the anticlinal areas of the eastern Basin--where is located the largest concentration of the Basin's mineral deposits, especially coal and iron--this area is rather well-balanced in various kinds of mineral deposits. In fact, this area is reasonably rich in every one of the strategic minerals, including salt, coal, iron, petroleum, copper, gold, and aluminum. Especially the salt production is the richest and the most important at present (Fig. 20).

•241 433 In agricultural richness and productivity, this agricultural area of southwestern Basin, as a whole, compares favorably with that of the specialized commercial agricultural area of the lower To-Fou valleys. This fact is evidenced by the fine, well-kept farmsteads here (Fig. 34). In terms of population density, this area also stands out as one of the five high densely populated areas of the Basin (Fig. 10).

E. Agricultural Products

241 The Szechuanese commonly claim that anything which is produced on earth may be found in the Basin. At least it is safe to say that there is scarcely an article grown in China which is not produced here in abundance. First of all, the summer field crops include rice, corn, sugar-cane, tobacco, potato, millet, kaoliang, cotton, beans of all kinds, and a great variety of vegetables and fruits. The winter crops include principally wheat, rape, beans, peas, and many others.

1. Common Food Crops

243 a) Rice.--Rice (oryza sativa) is the master crop of the Basin. It normally occupies 43,000,000 mow, or 42 per cent of the

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FIGURE 35

AGRICULTURAL PRODUCTION
SZECHUAN BASIN
1930 - 1935 AVERAGE

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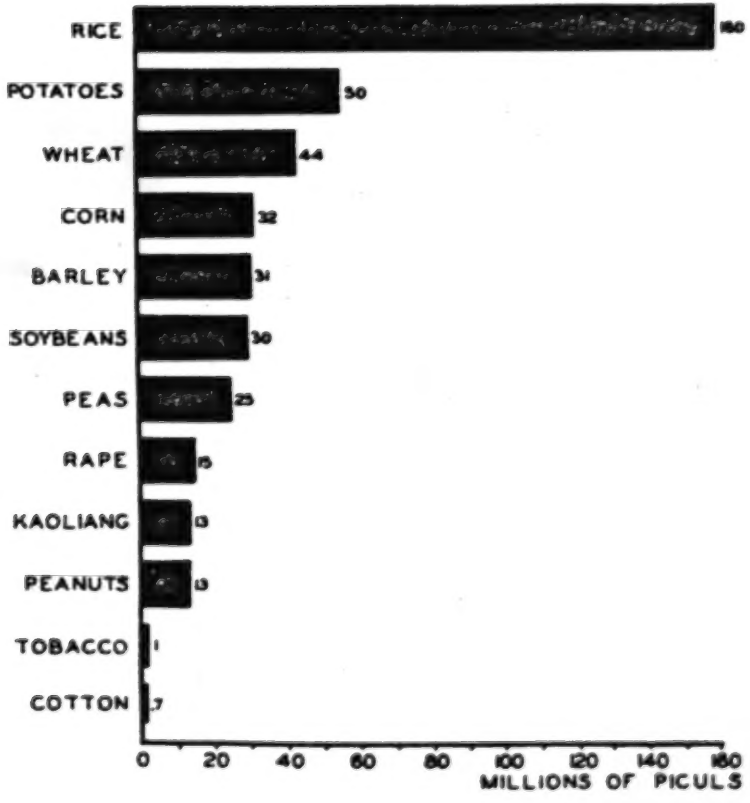

[Face p. 77]

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F. Conclusions on Agricultural Land-Use

Agricultural land-use of Szechuan Basin emphasizes the diversity of its agricultural products and the intensiveness of its land-use. The diversified topography, the great variation in availability of water supply, the different degrees of alluviation in different parts of the Basin, and above all, the high population density, all have contributed to the uniquely different agricultural landscapes in various parts of the Basin. The sharp difference between the appearance of Chengtu Plain and the rest of the Basin is particularly striking.

Geographically, it is interesting to note that in this area people with limited technological knowledge at their disposal have struggled through long ages of painstaking experiment, successes and failure, by trial and error, to find out the most effective way to wrest a living from the none-too-favorable environment. For ages, the Szechuanese have employed their ingenuity, their patience, and their tremendous man-power in trying to utilize every available spot of land for whatever type of crops would grow under its particular physical qualities.

The tremendous work of terracing; the diversified methods and ingenious devices for irrigation; the unique methods of soil culture, green manure, and fertilization composting; the complicated systems of rotating crops; the synchronization of the seasons of planting of various crops; and the elaborate and widespread practices of inter-culture, are all good examples of the effort to attain intensive agricultural land-use and greater production.

Here, in the Szechuan Basin, one finds a most distinctive case of how man and Nature have worked together, hand in hand, and it is plain that the vast human effort has served as the most important single factor in shaping the present patterns of agricultural land-use. The building and maintenance of various kinds of irrigation works, the terracing of huge hills into minute steps, the various practices of soil culture (such as carrying soil from lower slopes to higher fields), all these in the absence of mechanical power, require a tremendous army of labor. In addition, there are the stupendous and astounding job of transforming the dry fields in winter crops (such as wheat, beans, etc.) into wet fields for rice, and transplanting millions of young rice plants (one by one, by hand), within the short period of two weeks

7: Hu K-5 (1934-) 1946 AF16 Southwest China AF16

in early spring every year. Such agricultural practices and such intensive use of land as now prevail here in the Basin can only be maintained by abundant and cheap labor. In fact, it is the pressure of large numbers of men on the land that has resulted in the unique pattern of agricultural land-use here. 311 241.

Owing to the crowded population, to the limited land area, and to the extremely low standard of living, it is imperative to the Szechuanese that every inch of land which is cultivable at all be brought under cultivation. Many times, of course, this means very low production efficiency per capita.

The crop systems in the Basin are so adjusted and so synchronized as to utilize each piece of land to the maximum. For instance, if physical conditions, particularly water supply, permit, rice is always the preferred crop. If rice cannot be grown, the next best crop, such as wheat, corn, millet, or barley, will be planted. If even these crops are impossible, still other crops will be grown, and the land put to some productive use. The simple truth is that here millions of mouths have to be fed, and the Szechuanese absolutely cannot afford to let their land lie idle if this can be avoided in any way. Given the known physical assets, with the available technological knowledge, one may fairly say that the Szechuanese, so far as agricultural land-use is concerned, have made a shrewd "deal" with their physical surroundings. Another people with the same equipment, under the same conditions, both physical and cultural, perhaps could not have done in any way materially different from the Szechuanese.

Nevertheless, in spite of all that has been said above, the agricultural land-use of Szechuan Basin, especially in the light of modern technological development and in the face of modern scientific agriculture, cannot be said to be wholly satisfactory. As a matter of fact, many of the Basin's practices in agricultural land-use are miserably inefficient and call for drastic and immediate improvement. The extreme heterogeneity of the seed of nearly all the field crops, the lack of scientific seed selection and plant-breeding station, the marginal character and low efficiency of the production in many hilly areas, the lack of good drought-resistant crops in areas where natural rainfall is undependable, the failure in cotton-culture, the financial inability to obtain modern complete chemical fertilizers, the wasteful practices of the so-called "winter-storing-water-field"

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system, and above all, the inefficiency of many of the superfluous ditches and irrigation works, are notable examples. The successful solution of any of these problems will undoubtedly bring about a higher efficiency in the agricultural land-use of the Basin.

2: Wiens G-4 (no date) 1954 AF17 South China AF 17
Southwest China
AF 16
Miao AE 5

S 175 563 642 M 175 563 648

Ch'uan otherwise known as General Fu Yu-te, as the "South-Pacifying General.". He was instructed to lead an army to conquer Yun-nan which had reverted to the independent rule of local chieftains after the collapse of the Mongol Dynasty. General Fu Yu-te commanded an army of 100,000 which assembled in Hu-kuang Province (Hu-pei and Hu-nan area). Aside from a part of his army which he dispatched post-haste to Wu-san (present-day Wei-ning in western Kuei-chou)(See Photos 7 and 8), he personally led the main body. He entered Kuei-chou from Hu-nan along the Yuan River route. It is readily understandable that with Fu Yu-te's large army burdening the area, many Miao would feel compelled to migrate southward. And when the north Kuang-hsi Miao of today are asked at what period they migrated there, they invariably reply with the two characters Hung-wu for the first Ming Emperor's name, showing that they migrated there at the end of the 14th Century.

A few Miao are found scattered among the Li tribes of Hai-nan Island. During the reign of Chia-ch'ing (1522-1567), there was a major suppression campaign against the Li tribes of Hai-nan. At this time, Kuang-hsi Miao

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SW [133 134 241]

Photo 7. Wei-ning district, Kuei-chou Province (26° 52' N, 104° 17' E)

North of the town of Wei-ning and the Ts'ao Hu shown in Photo 6, the characteristic plateau forms of northwest Kuei-chou reveal a topography that in the large appears relatively even except where mountain systems such as the Miao Ling at the upper left of photo span the surface. The rugged parts of the non-mountainous terrain are found where great canyons and deep, narrow valleys such as the one in the foreground have been eroded far below the surface of the plateau. The middle terrain is pock-marked with an almost straight line of sink-holes testifying to easily soluble underlying limestone rock that often is found in Kuei-chou. Lolo and Miao slope-farmers cultivate the hilly land in the foreground, and terrace ridges run down the inter-locking ridges of the great canyon. Many terraces appear to be abandoned. The slope soils are poor, acidic yellow earths from which fertility goes quickly with crop cultivation.

2: Wiens G-4 (no date) 1954 AF17 South China AF17
Shan-Thai AL3
Southwest China AF16

twelve "Panna," with some differences from the smaller t'u-ssu domains mentioned on the previous page. Only four are found in both lists, Liu-shun, Meng-lung, Meng-che, and Meng-a. The Sip Song Panna was to have formed part of the buffer state proposed in discussions by the French and British in 1895 but this was found impracticable, so that the last hope of an independent T'ai state here failed to materialize.[76]

Of the twelve subordinate states listed by Carey, Wu-tei and Meng-wu were annexed to French Indo-China. The chief towns of these two were Muang-u-nua and Muang-u-tai respectively, situated on the Nam U, a river which joins the Mekong just above Luang Prabang. Said Carey, in 1899, "The history of the 'Sip Song Panna' seems to have been a series of disputes about the succession; and desultory fighting for the supremacy was kept up for years, and until quite recently between rival chieftains."[77]

Photo 14. Ching-kang, Yun-nan Province (21°46' N, 100° 14' E)

In this view are seen the mountain lands and basins of the southwestern Yun-nan frontier adjacent to Burma. The northward-looking view is from approximately above Ching-kang village, with the elongated river basins of Fu-hai (Meng-hai) in the middle distance. This area constitutes part of the recently established T'ai Autonomous Region organized by the Chinese Communists. Fu-hai has been a Han-Chinese administrative seat in southwest Yun-nan for about two decades and together with Ch'e-li formed the southernmost Chinese district seats in Yun-nan. The river basin is well settled by the wet-rice farming T'ai tribes, while slope farming mountain tribesmen, whose farms are seen in the white patches in the foreground, periodically shift their fields in a migratory system of agriculture, burning forests and brush for new fields as old farms become exhausted. Several states in the cycle of cultivation and abandonment are visible in this photo. It was into the Burmese Shan areas west of this region that the last remnants of the Nationalist armies under General Li Mi fled when the Communists overran China in 1949. Pocketed in such terrain as seen here, aided by local tribesmen, this force successfully withstood Burmese attacks for several years.

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872 each pupil bellowed. "If he doesn't bellow, he isn't learning, but chattering or making mischief."

The mandarin pays for the upkeep of this school. The children live and eat in the castle and bring only their sleeping blankets and in winter a coal brazier from home. "The lessons are conducted according to the new Western style," the teacher told me. Every hour there was a short pause and every day there was physical exercise. If the teacher wanted to begin or interrupt the lessons he drummed on a hollow tree trunk, just like a South Sea Islander.

241 166 The mandarin was also obliged to distribute seeds to the Chinese immigrants; and because the last few years there had been poor harvests he had to order tsamba from Dawo and Romi Tschanggu and rice from the city of Ya tschou. (1) Otherwise all the colonists would have

1. The price for barley in Tschanggu was exactly 15 times as much as in Hsining fu.

long since gone home to China. The colonization here, unlike that of Mongolia, is sponsored by the government. A few years ago 100 families were established here; they had land as well as free seeds, schools for their children and complete freedom from taxes for the first years. And yet conditions were so unfavorable that more than half of them had already gone back and there were only 40 Chinese families left.

657 From the Tibetan families the mandarin gets free escort (ula) and compulsory military service, besides 2.5 Candareen (tael cents) a year. Thus, his income is slight and during each meal Wu da lao ye complained when it came to the rice and rice wine that in this post he had to supply a great deal (presumably 2,000 taels annually).

353 The hall in which my first reception had taken place was also the dining hall where the mandarin, his first secretary, the teacher and /Plates XLV, XLVI, XLVII and XLVIII appear between pp. 192 and 193 in the original text./ /193/ I were served. (1) Already in

[262] 1. Wu tschin hsü Da lao ye had even had Chinese pigs brought from the lowlands for slaughtering because he thought the Tibetan species which is raised throughout Hor in large quantities, was too fleshy and tasted bad. The Hor Tibetans eat their pork sometimes raw and sometimes cooked.

strawberries and strawberry blossoms reminded me of the German forests. We did not see any game except foxes and now and then a band of monkeys that fled from branch to branch with a great deal of noise. C 137 [136]

Many of the Hsining horses which were not used to the narrow and slippery paths, fell down the embankment, and always delayed us at the countless shaky bridges. At each bridge the packs had to be unloaded and carried over individually by us humans, while the animals were held at the head and tail and half lifted and half shoved across to the other shore. Fortunately not one of the horses was in such good spirits while this was going on that it felt like making wanton capers. A few of the bridges that were 30 paces long were made of only a single plank which lay only a handbreadth on the spars that extended from the banks of the river. At every step the planks bent and swayed so that the horses could hardly keep on their feet unaided. Four meters below, the cataract tore, roared and foamed. My old bitch Tschimo always got dizzy and when everyone else had crossed she cautiously crossed the plank on her belly. 000

Beginning at 2,400 meters the settlements in the narrow wooded valley began to grow denser. For a long time there were only isolated farms and small groups of houses, most of which in the narrow valley bottom are inhabited by Chinese colonists. They squat in miserable straw huts, whereas the Tibetans occupy stone houses on the steep clearings of the slopes. They have here remained wealthy land owners. But for how long? The Tibetans plant little corn, but a great deal of barley and wheat. The Chinese in the bottom of the valley plant corn almost exclusively and are traders. C T 361 241 ●

Every afternoon toward two o'clock we made camp upon some /Plates XLIX, L, LI, and LII appear between pp. 216 and 217 in the original text. / /217/ small clearing. The animals always found some food in the woods and were also fed with corn and tsamba which we had brought from Ta tsien lu. Most of these clearings originated as a result of forest fires. At all of them were to be found the familiar three stones (tab rdo) which had served previous travelers as a cooking place. These are also regarded by the natives here as the home of some hearth god who wishes to be well treated. Woe to him who touches the three stones with his foot who carelessly drops the kettle and perhaps spills its hot contents on the three stones or on the fire! Without doubt luck will be against him from that moment on! C T 777

C 361 south to the seat of the Tu se or rgyalbo of Mu ping (Tibetan: dschumba), that is, to the native king who has received the highest Chinese title among all Tibetan aristocrats and secular rulers. Thus, he is one into whose kingdom the Chinese have penetrated most deeply and intensively and who is next in line to becoming a John Lackland, giving way entirely to the Chinese.

There are good reasons why the Chinese have settled in larger numbers in Hsin gai, Mu gung and Ying gai and why they have moved the center of administration thither. There is no other place far and near suitable for a populous settlement. Since I had left C 241 Hor Gantse I had not found so many fields in such close proximity. Fifty and a hundred meters above the river which is wedged in between rock walls, the valley spreads out in terraces (Plate LXII) which permit extensive plantings, particularly of corn and also of wheat, beans and buckwheat. (1)

C [435]

1. Corn forms the chief nourishment of the inhabitants. At the time of my visit the price of one cattie (600 grams), according to existing exchange, was seven pfennig, whereas in Ta tsien lu a cattie was 25 pfennig and shortly thereafter the prices constantly rose in Ta tsien lu. It is true, Ta tsien lu had to get all its food supplies from the lowland, in fact some things are carried thither from Ya tschou fu on the backs of human beings.

T C 631 175 Mu gung ör fu ting is the administrator and judge of the so-called western Miao tse countries which were subdued and became subject to the Manchu Emperor Kien lung only after two great and bloody wars during the years 1747-49. The decisive and final victory came in the years between 1771 and 1776. It is only since that time that they have come under the Chinese administrative system and been opened up to Chinese colonization and mass invasion. (2) The administrative district of the Mu gung ting is

2. De Mailla, Histoire g. de la Chine, Paris 1780, Vol. XI, p. 589 ff., mistakenly counted these Tibetans from present-day Mu gung ting among the primitive people of Miao tse /223/ and for this reason we still find the history of their conquest in many new history books under the Miao tse wars. D. M. confines himself

T 669

that surely the earth and mountain spirits would send bad harvests if the earth were burrowed through. After this dispute the Bati put up a princess as queen, and when the tu se family of /Plates LVII, LVIII, LIX and LX appear between pp. 240 and 241 in the original text./ /241/ Tschoskiab sent at the head of 2,000 men a prince who wanted to marry the princess, there was a long fight between Bati (Brasdi) and Tschoskiab and many were killed before the Chinese finally acted as mediators, upheld the prince as rgyalbo of Bati, and for the present abandoned the mining of the gold fields.

C 361

On the second day I reached the Chinese town of Fu pien where I was welcomed by a most gracious little civil mandarin who for a long time would not permit me to set up camp in the open when I could find no room in the inns with my animals. He saw to it that we stopped at least in the examination hall. On the next day he gave me as escorts two very reliable men and his own tung sche. Even below Fu pien the valley shows a broad rock terrace made up of slabs of sandstone that have a strike of N 40-60° W, a terrace in the valley on which are situated fields and villages, and beside which the wild waters of the Little Gold River has, in more recent times, cut a narrow gorge that is often more than 100 meters deep. At Fu pien the terrace and the mountain slope are covered with a thick padding of loess-loam mixed with rubble. (1) In order to get level fields, the

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1. Such formations are said to be common also in Hsü ching at the Great Gold River, and even in Ngaba, agriculture seems to be based on the loess that is present.

Chinese dug many small steps out of this loess, so that they built up a landscape of artificial steps similar to that in North Shensi and Shansi. The Chinese here always call themselves k'e bien, guests, in contrast to the man tse, literally "the barbarians."

T 361

Above Fu pien, the road gets broader and more comfortable by the hour. At 2,800 meters I had finally left behind the zone of V-shaped valleys. A new day's march brought me to Lien ho kou, at an altitude of 2,995 meters, where a darro and a police lieutenant with three soldiers lived beside a colonist gai of not even 50 two-story houses. The house of the darro, according to Tibetan custom, also served as the stopping-place for dignitaries (Plate LVI). On the ground floor I found stables, on the second floor were the rooms and the kitchen, and broad verandas looked down on the inner court.

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